SECTION I - BACKGROUND

A. Introduction

A1. Background

Market Access for Rural Development (MARD) Project was started during Fiscal Year 1996/1997 in 5 districts of the Rapti Zone and 3 districts of the Bheri Zone of the Mid-Western Development Region (MDWR) to promote high-growth agriculture model which fosters market-led and demand driven agricultural commercialization. The MARD Activity was envisaged to be the principal vehicle through which USAID/Nepal contributes to the successful implementation of the Agriculture Perspective Plan (APP) strategy for the hills. The Plan describes the conditions necessary for accelerated agricultural growth and employment growth – the key to reducing poverty. The hill strategy envisaged expanding production of key high – value commodities and overcoming farm level constraints to rapid expansion. It was also designed to improve post-harvest handling and processing of these commodities to increase their market value, increase the efficiency of production and marketing inputs, and increase farmers access to markets for their products. If the APP is successfully implemented, Nepal's agricultural growth rate will accelerate to 5% annually.

The MARD Activity was designed as a 6-year activity that would provide high-value crop production and marketing assistance to farmers and agro-entrepreneurs in selected "pockets" of the project hill districts of Mid West Development Region. The Activity would demonstrate the continuing viability of the high-growth agriculture model. USAID is assisting the Government of Nepal (GON) in the implementation of MARD by funding a Cost-Plus-Award-Fee contract for technical assistance, training, and equipment. Assistance is provided over a five-year period beginning April 1, 1997, for a total contract cost of $3,653,761 (as of contract modification no. 1, June 23, 1999). The contract award fee is based on performance targets, rather than usual level of effort approach. The amount of the award fee is determined on an annual basis by USAID/Nepal. The TA team is provided by the prime contractor, Chemonics International Inc. (CI), and its MARD/Rapti partners, METCON Consultants (MC), No-Frills Consulting Co. (NF), Nepali Technical Assistance Group (NTAG), University of California-Davis (UCD), and Volunteers in Overseas Cooperative Assistance (VOCA). CI is providing overall leadership, administrative and policy support. MC is leading local marketing development and production technical assistance. NF provides local technical assistance in technology and improved agricultural extension. NTAG and UCD are associated in providing technical assistance for programming and monitoring improved nutritional status. In addition, UCD is training and consulting in post harvest handling. IESC and VOCA are providing short-term technical assistance in agricultural production, processing, and distribution.

The MARD/Chemonics TA Team was originally deployed in Rapti zone at the beginning of the MARD/Chemonics contract. At Rapti the TA team implemented MARD activities in all the five districts but because of security concern two districts Rukum and Rolpa had only limited activities and the three districts Dang, Salyan and Pyuthan had normal field activities as planned. However, the team was relocated to the Lumbini-Gandaki zones' 6 districts: Nawalparasi, Rupandehi, Kapilvastu, Palpa, Syangja and Kaski (Exhibit 1) in the Second Project year in September 1998 after the Team's Salyan District (Rapti zone) Coordinator,

Exhibit 1: Location of MARD/Lumbini-Gandaki Project Areas

Rabindra K. Shrestha, was murdered in the line of duty by terrorist in Salyan on May 31, 1998. After detailed deliberations with USAID of 6 Lumbini-Gandaki districts. Subsequent Annual Work Plans for fiscal years 1999/2000, 2000/2001 and 2001/2002 were prepared based on bottom-up planning exercises with Village Development Committee farmer groups and review with Project Coordinator Office(PCO) and approval of Cognigent Technical Officer(CTO).

A2. Project Objective

The purpose of the MARD project is:

1. To increase sales of agricultural commodities by promoting market expansion and participation of farmers and agro-entrepreneurs in high-value commodity production and marketing.

2. To improve the nutritional status of farm households, particularly pregnant and lactating women and children under 60 months of age, by increasing household nutrition and improving household nutritional practices.

B. Project Organization

The overall project organization is based on the grant agreement reached between HMG and USAID on January 26, 1996. The agreement stipulates the organization and responsibilities of the MARD Steering Committee, the MARD Activity Coordination Committee (MACC), and the MARD Activity Implementation Coordinator (AIC), in providing additional directional, monitoring, coordinating, and line agency TA support, as well as field office and training space. The MARD Steering Committee, provides overall policy guidance to the project through semi-annual meetings. Under the Western Development Region organizational structure, the MACC coordinates programs of the TA team and HMG line agencies through trimester meetings.

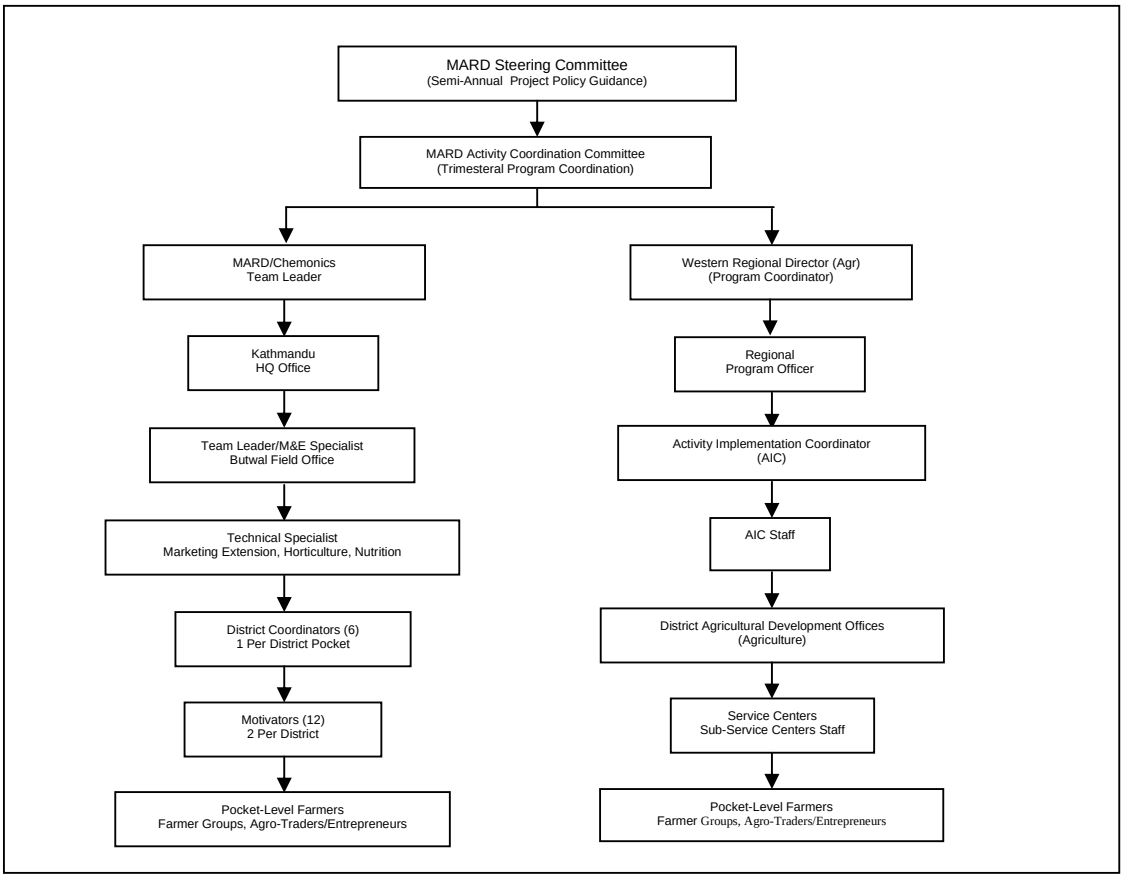
The status of the Project Co-ordinating Officer (PCO) is at Tulsipur and the TA Team operated from the PCO building as well as from its own rented facility. After the TA Team was relocated to Lumbini-Gandaki, TA-Team field office was established at Butwal and the Western Regional Directors of Agriculture and Livestock Services have been effectively providing MARD project co-ordination from the Second Project Year to present. The PCO also established a liaison office at Butwal in the fourth project year to facilitate coordination with the district line agencies. The TA Team organization according to the Grant Agreement organizational structure is summarized in Exhibit 2.

B2. Project Interventions

Project interventions are organized into 4 components that focus on **market development, technology and improved extension, improved nutrition, and bottom-up planning and policy reform.** The interventions are being implemented by the TA team and HMG line agencies in close collaboration with farm leaders, farmer groups/ production marketing groups, NGO's, village development workers, district development offices, and other relevant entities to support the project's main beneficiaries, the rural households of the Lumbini-Gandaki zone.

The High Value Commodities (HVC) covered in the MARD/Rapti project activities were fresh vegetables, vegetable and crop seeds, Fruits, Livestock and Poultry, and Dairy Products. However, vegetable and crop seeds was dropped in the MARD/Lumbini-Gandaki.

Exhibit 2: Project Organization Chart



The Mid-term Evaluation held during September-October, 1999 recommended dropping of livestock component to strengthen and increase focus on high value crop marketing. As a result, livestock component has been dropped effective from January 2000 in MARD/Lumbini-Gandaki and focus on cash crop marketing considerably increased from March 2000 in the project pockets.

B3. Project Co-ordination

Project coordination and oversight were achieved through 5 specific managerial efforts, as per the Joint Task Force recommendation:

1) **Semi-annual meetings** convened by the MARD Steering Committee provided project policy guidance to the TA Team and the relevant HMG line agencies. Membership in these meetings included the Team Leader, the Regional Director (Agri) Surkhet/Pokhara, the Project Coordinator and the ARD/USAID/N.

2) **Trimester meetings** (every 4 months) convened by the MARD Activity Coordination Committee to coordinate field programs between the TA Team and the

relevant HMG line agencies and the donor ARD/USAID/N. These meetings will be chaired by the Regional Director of Agriculture. HMG membership included the Project Co-ordinator, and the District Agricultural Officers for the project districts. TA Team membership included the Team Leader, the Technical Specialists, the District Coordinators and the M&E Specialist. In Second Project Year bi-monthly coordination meeting with Line Agencies were also regularly to improve coordination but because of time constraint of LA, bi-monthly coordination meetings were dropped.

3) **Monthly staff meetings** were held at the district level between the TA Team's District Coordinators and the respective District Agricultural Officers to co-ordinate pocket-level project interventions between the TA Team and district agricultural programs. District Agricultural Development Officers, in addition to working with Team District Co-ordinators assigned specific technical personnel to work on HVC production and marketing in additional 2 pockets per district of MARD/Lumbini-Gandaki districts TA Team's DC assisted DADO assigned specific technical personnel on periodic basis to develop the new pockets in each district.

4) **Regular informal meetings** were held at the pocket level between TA Team's District Co-ordinators/Motivators and staff of the relevant Agricultural Service Centers and Sub - Centers to co-ordinate HVC production, marketing and nutrition activities with corresponding district agriculture programs in the pockets.

5) **Quarterly performance reports** of progress on the annual work plan were submitted regularly by the TA Team to the USAID and to the Project Coordinator for distribution within HMG system.

C. Project Area Background

C1. MARD/Rapti (April, 1997-May, 1998)

C1a. Project Area

The project activity area comprised of 10 production pockets encompassing 51 VDCs/Municipalities with 189 sites as follows:

Dang	**Salyan**	**Pyuthan**	**Rukum***	**Rolpa***
• Lamahi (6 VDCs)	• Tharmare (7 VDCs)	• Bijuwar (5VDCs)	• Musikot (1VDC)	• Jinabang (2VDCs)
• TulsipurA (8 VDCs)	• Kapurkot (4 VDCs)	• Devisthan (5VDCs)	• Chhibang (1VDC)	4VDCs)
• Tulsipur B (4VDCs)	• Bhotechour (5VDCs)	• Macchhi (6VDCs)		
• Ghorahi (1 Municipality)				
• 4 Pockets (19 VDCs/Municipalities)	• 3 Pockets (16 VDCs)	• 3 Pockets (16 VDCs)	• 2 Pockets (2 VDCs)	• 2 Pockets (6 VDCs)

* The TA Team's activities in Rukum and Rolpa were of limited nature because of security concern.

C1b. Demography

In Rapti 3 project districts: Dang, Salyan and Pyuthan, there are 3,50,103 population with 60,015 households and cultivated land is 1,37,573 ha. The farmer organizations, co-operatives and Agro-vets found are 47, 35 and 8 respectively (Table 1).

Table 1: Demography of MARD Pocket

Parameters	Dang	Salyan	Pyuthan	Rukum*	Rolpa*	All Pockets
Population	215289	69320	65494			350103
Household	36155	11252	12608			60015
HH Size	5.95	6.16	5.19			17.3
Cultivated land (ha)	52682	39544	45347			137573
Upland (ha)	22022	33853	38570			94445
Lowland (ha)	30660	5691	6777			43128
Farmer ** Organizations	20	15	12			47
Registered Co-operatives	18	11	6			35
Agro-vet	6	2	0			8

* Limited training activities, mostly conducted from Tulsipur Office.
** Active farmer organization/groups in HVC.

C1c. MARD Intervention Pockets

In Rapti, there were 10 pockets in three districts - Dang, Salyan and Pyuthan covering 189 intervention sites. In addition, TA-Team had helped farmers of Rolpa and Rukum through training, tours and workshops to a limited extent.

Table 2: MARD Intervention Pockets and Sites in Rapti

S.N.	District	Pockets/VDC/NP	Name of VDCs	No. of Sites/VDC
1	Dang	Lamahi	Chaulahi	6
			Satbaria	2
			Sonpur	2
			Sishaniya	7
			Lalmatiya	1
			Gobardiya	3
		Tulsipur A	Tulsipur	10
			Bijauri	1
			Halwar	3
			Hekuli	5
			Shantinagar	4
			Pawannagar	2
			Tarigaon	1
			Urahari	3
		Tulsipur B	Shreegaon	4
			Dhanauri	5

S.N.	District	Pockets/VDC/NP	Name of VDCs	No. of Sites/VDC
			Panchakule	5
			Purandhara	9
		Ghorahi	Tribhuwan NP	4
		Total	19	77
2	Salyan	Tharmare	Tharmare	11
			Pipalneta	4
			Damachaur	2
			Kotmaula	3
			Bajhkanda	1
			Shideswari	1
			Kajeri	1
		Kapurkot	Sinbang	2
			Rim	8
			Garpa	6
			Dhanabang	10
		Bhotechaur	Falabang	4
			Chhayachhetra	5
			Korbang	3
			Tribeni	1
			Syanikhal	1
		Total	16	63
3	Pyuthan	Bijuwar	Bijuwar	4
			Dharmawati	5
			Majhkot	4
			Bijaynagar	3
			Khaira	4
		Devisthan	Bangesal	4
			Dhungegadi	2
			Nayagaon	4
			Gothibang	2
			Bhingri	2
		Machhi	Maranthan	2
			Torbang	4
			Okharkot	4
			Badikot	2
			Tusara	3
			Libang	1
		Total	16	49
		Grand Total	51	189

C2. MARD/Lumbini-Gandaki (September 19998 – March 2002)

C2a. Project Area

The project activity area comprised of 6 production pockets encompassing 24 VDC/Municipality with 170 sites. Each production pocket is composed of 4 contiguous VDCs as follows:

Rupandehi	Kapilbastu	Nawalparasi	Palpa	Syangja	Kaski
• Khudabagar	• Kapilbastu NP	• Gaindakot	• Madanpokhara	• Dahathum	• Bharatpokhari
• Dayanagar	• Niglihawa	• Mukundapur	• Masyam	• Changchangdi	• Sisuwa
• Dhamauli	• Dhankauli	• Amarapuri	• Tansen NP	• Waling NP (A)	• Lekhnath NP
• Kamariya	• Dohani	• Rajahar	• Dovan	• Walling NP (B)	• Kalika

The locations of the MARD pockets are shown in above Exhibit 1.

C2b. Demography

In Gandaki-Lumbini, according to Performance Monitoring Data for the Fifth Project Year, 2001-2002, the project area population is 238,715 with 41,620 households. Of the total cultivated land 26,033 ha, lowlands constituted 18,143 ha. and the rest were uplands (Table 3).

Table 3: Demography of MARD Pockets (includes only 4 VDC/NPs per Pocket)

Parameters	Nawal-parasi	Rupan-Dehi	Kapil-vastu	Palpa	Syangja	Kaski	All Pockets
Population	60,853	31,805	50,011	33,551	22,487	40,007	**238,715**
Household	9,018	6,193	8,915	6,014	4,224	7,256	**41,620**
HH Size	6.75	5.14	5.61	5.58	5.32	5.51	**5.74**
Cultivated land (ha)	3,824	6,164	5,352	2,820	2,258	5,614	**26,033**
Upland (ha)	1,654	12	289	1,951	1,610	2,374	**7,890**
Lowland (ha)	2,170	6252	5,063	869	648	3,241	**18,143**
Farmer Organizations	31	40	32	63	136	130	**432**
Reg. Co-operatives	17	5	3	74	9	8	**116**
Agro-vet	13	10	5	8	11	25	**72**

Source: MARD/Lumbini-Gandaki Performance Monitoring Data for the Fifth Project Year, 2001-2002, Technical Report No. 111 prepared by MARD/TA Team, March 2002.

C2c. Intervention Pockets

In Gandaki-Lumbini, 6 pockets namely, Nawalparasi, Rupandehi, Kapilvastu, Palpa, Syangja and Kaski with 3 VDCs/NPs per pocket covering 72 sites were selected in the year 1998 and reached to at-least 4 VDCs/NPs covering 123 sites by November 2001 (tables 3 & 4).

Table 4: MARD Intervention Pockets and Sites in Lumbini-Gandaki

S.N.	Pockets/VDC/NP	Name of VDCs	No. of Sites/ VDC	Remarks
1	Nawalparasi	Gaindakot	5	
		Mukundapur	5	
		Amarapuri	3	Salghari site dropped
		Rajahar	6	
	Total	4	19	
2	Rupandehi	Khudabagar	4	
		Dayanagar	7	
		Dhamauli	4	
		Kamhariya	4	
	Total	4	19	
3	Kapilvastu	Kapilvastu NP	8	
		Niglihawa	7	
		Dhankauli	8	
		Dohani	8	
	Total	4	31	
4	Palpa	Madanpokhara	4	
		Masyam	4	
		Tansen NP	4	
		Dovan	4	
		4	16	
	Total			
5	Syangja	Dahathum	3	Darsing site dropped
		Changchangdi	5	
		Walling NP (A)	5	
		Walling (B) Dhanubase	7	
			20	
	Total	4		
6	Kaski	Bharatpokhari	5	
		Shishuwa	4	
		Lekhnath NP	5	
		Kalika	4	
	Total	4	18	
	Grand Total	24	123	

SECTION II – IMPLEMENTATION STRATEGY

The foundation of the TA Team's implementation strategy is a set of clearly defined performance indicators that support USAID/Nepal's R4 strategic framework and HMG's agricultural strategy, as defined by the Agricultural Perspective Plan (APP). A set of development principles guides the Team in the design and implementation of interventions that are most likely to achieve the annual target for each performance indicator. Finally, an operational approach is described for using project resources to achieve performance targets.

A. Performance Indicators

The MARD Project aims to implement interventions in market development, production technology and improved agricultural extension services, nutrition practices, and bottom-up planning and policy reform to accelerate rural development. The effects of these interventions were measured through changes in observable performance indicators over the life of the project. Exhibit 3 illustrates the expected relationships between project interventions and agricultural production, one of the project's most important precedents for market development.

Shortly after the Team relocated to the Lumbini-Gandaki zone in the second project year, a benchmark survey[1] was conducted to estimate the currentlevel (at project start) of critical project performance indicators, which were then established as performance benchmarks, or references for evaluating future project impacts. Future changes in performance indicators (production, in the case of Exhibit 3) were then forecasted based on assumptions about the past trends (low growth rates) without the project. As interventions were implemented during the project, performance indicators increased at a much greater rate than if the project pockets had not received MARD assistance. Therefore, the net effects of project interventions on performance indicators (shaded area) are shown as the vertical distance between measured results "with project" (dashed curve) and estimated results that would have resulted "without project" (dotted curve).

The new performance indicators (approved by USAID on August 2000) are summarized by project component in Exhibit 4. These indicators were used to determine the annual award fee under the Chemonics contract.

[1] MARD/Chemonics TA Team. *MARD/Lumbini-Gandaki Performance Benchmark Data for the Second Project Year, 1997-1998.* MARD/Lumbini-Gandaki Technical Report No. 26, November 1998.

Exhibit 4: MARD/Chemonics Performance Indicators, 1999-2002

Market development component (SO 1.1)	**Technology and improved agriculture extension service component (SO 1.1)**
▪ Sales of high-value agricultural products in project areas **(10%)** ▪ Farm households producing high-value agricultural and livestock commodities **(5%)** ▪ Farmers producing high-value agricultural and livestock commodities in project areas **(5%)** ▪ Percent of potato, tomato, cabbage, and cauliflower produced in project areas that is sold **(10%)** ▪ Number of agro-vets operating in project areas **(10%)**	▪ Hectares of potato, tomato, cabbage, and cauliflower harvested in project areas **(10%)** ▪ Average yield of potato, tomato, cabbage, and cauliflower harvested in project areas **(20%)** ▪ Farmers groups assisted in project areas **(10%)**
Improved nutritional status component	**Bottom-up planning & policy reform component (general support of SO 1.1 & nutrition component)**
▪ Nutritional practices that reduce the incidence of night blindness among pregnant/lactating women **(10%)** ▪ Incidence of night blindness among pregnant/lactating women **(10%)**	▪ Represented by all project indicators

Note: Contract performance award fee weights are shown in bold parentheses for each indicator.

On January 10, 2000 revised new performance indicators were proposed to USAID and approved on August 2000 (Exhibit 5). This new set of indicators is effective for fourth and fifth project year periods.

Exhibit 5: MARD/Chemonics New Performance Indicators, 2001-2002

Market development component (SO 1.1)	**Technology and improved agriculture extension service component (SO 1.1)**
▪ Sales of high-value agricultural products in project areas **(20%)** ▪ Percent of potato, tomato, cabbage, and cauliflower produced in project areas that is sold **(10%)** ▪ Number of agro-vets operating in project areas **(10%)**	▪ Hectares of potato, tomato, cabbage, and cauliflower harvested in project areas **(10%)** ▪ Average yield of potato, tomato, cabbage, and cauliflower harvested in project areas **(20%)** ▪ Farmers groups assisted in project areas **(10%)**
Improved nutritional status component	**Bottom-up planning & policy reform component (general support of SO 1.1 & nutrition component)**
▪ Nutritional practices that reduce the incidence of night blindness among pregnant/lactating women **(10%)** ▪ Incidence of night blindness among pregnant/lactating women **(10%)**	▪ Represented by all project indicators

Note: Contract performance award fee weights are shown in bold parentheses for each indicator.

B. Performance-Based Development Principles

The Team's overall approach to the design and implementation of MARD interventions were guided by: the potential for sustainability; opportunities to expand women's participation; the synergy of bottom-up planning and policy reform; and flexibility to address new problems.

B1. Sustainability

Experience during the Second Project Year showed that, while the Lumbini-Gandaki zone has relatively more infrastructure, its agricultural productivity and market capacity were not significantly greater than the Rapti Zone. The Team's assistance continued in interventions that promote sustainability by being market driven, geographically relevant, and capacity strengthening, and promoting self-reliance.

Market Driven – The Team's assistance program were focused according to the market incentives that can be expected to accrue to Lumbini-Gandaki producers, traders, and agro-entrepreneurs. To ensure market relevance of its approach, the Team's interventions focused on translating information from key markets into production, processing, and post-harvest action plans. The interventions focus on introducing competition into marketing, which involved the creation of more market outlets to allow producers and buyers to negotiate directly. Information on contract growing, processing options, and destination market conditions were distributed through motivators and extension specialists to allow growers to make their own production decisions. The production technology model developed under Rapti II was applied consistent with a farmer's decision to adopt a production or marketing intervention based on the competitive net returns to the family labor supply. This meant that the interventions should yield net returns to household labor that are substantially above the local market wage rate, which currently ranged from about Rs 60 per day in Ruphandehi and Palpa pockets to about Rs 150 per day in Kaski pocket.. Likewise, priority "high-value" commodities are defined by the extent to which net returns to household labor are substantially above the local market wage rate. This approach has identified potato, cabbage, cauliflower and tomato as the commodities that have the highest potential for increased sales. In addition, the TA team focused in promoting market demanded crops such as cucumber, gourds, radish, squash, french bean, eggplant, banana, papaya, etc.

Additional efforts were made to mobilize and strengthen farmer groups to promote commercial production in clusters for group marketing to reduce marketing cost as well as to increase market competitiveness. This approach encourages farmers to group gathering and group marketing of their produce that enabled them to bargain for a better price in the nearby wholesale markets.

Geographically Relevant – The extent to which Lumbini-Gandaki zone farmers and traders are able to exploit its competitive advantages were based on their ability to exploit the zone's agronomic and climatic diversity. In addition, the geographic location that offered market access to compete with low-priced Indian imports has become most important. The Team assisted with production technology information packages and marketing assistance to complement the relevant ecological sub-zones' seasonal temperatures, rainfall or irrigation availability, and access to transportation infrastructure.

Capacity Strengthening – Effective assistance to MARD farmer and trader beneficiaries largely depended on the Team's ability to create effective working relationships between project staff, line agencies, village-based NGO and self-help groups, and private sector agro-industrial links to the zone. These relationships are the Team's first channel for disseminating technical information and know-how on market development, high-value agricultural production, and nutrition improvement. The Team helped line agency staff to upgrade their abilities in key technical areas of project performance-based interventions through training-of-trainer events, study tours to national and regional companies and research institutions, and computer application skills. Village-based NGO and self-help groups were assisted in developing their capacity to promote sustainable development by coordinating their programs with MARD whenever possible, and collaborating with them on bottom-up planning and policy reform. Private sector agro-industrial entrepreneurs, agro-vets(agro-input and seed traders) were assisted in their market development planning by providing them training and by linking them to key production and marketing information.

Self-Reliance – In this age of limited development assistance and fiscal austerity, the Team encouraged self-reliance in its collaborations with project beneficiaries and relevant HMG agencies, NGO's and self-help groups. This meant that Team technical assistance programs emphasized the use of knowledge and skill transfer to shape rural households' economic destinies. The ***Team did not participate in any programs that provide direct producer subsidies or income transfers.***

B2. Women's Participation

The Team recognizes that women constitute the majority of the labor force in many rural areas. It is not uncommon for women to provide over 60% of the farm and marketing labor supply, particularly when men join seasonal out-migrations in search of work in urban areas in Nepal, or outside Nepal. Women are also the primary force in improving family nutrition. Preference was therefore given to activities which allow women expanded roles in planning and participation in rural development programs. Besides vegetable and fruit production, women are involved in marketing vegetable, fruit, livestock and poultry commodities, as well as operating agro-enterprises that manufacture vegetable, fruit, and livestock products. Women led the nutrition demonstration households within project production pockets, and encouraged male household members to participate in nutrition demonstration activities.

B3. Bottom-Up Planning, Co-ordination and Policy Issues

Agriculture and food policy was and is often developed and implemented at the national ministry level. In contrast, a large portion of current policy problems directly effect rural households, without clear mechanisms for local participation in the policy reform process. For example, in the aftermath of the past Agricultural Input Cooperation monopoly on the import and distribution of fertilizer, the lack of sustainable replacement fertilizer markets is an important constraint to crop productivity. Lack of decentralized tax and expenditure authority for local governments has perpetuated the municipal octroi tax as a major barrier to interregional agricultural trade. And continuing import restrictions on packaging materials pose a major constraint to value-added marketing of agricultural products. The TA Team helped in developing information at the farmer and trader level for organizing and prioritizing bottom-up identification of policy problems and developing local initiatives to expedite policy reforms. ***The Team also recognized that the bottom-up planning process is***

a critical element in strengthening the role of governance in establishing appropriate responsibilities for the public and private sectors in the rural development process. As VDC is the basic politically autonomous unit in the country's devolution process, the Team recognized that bottom-up planning of participatory development activities should be at the VDC level.

B4. Flexible Responses to New Problems and Opportunities

The TA Team emphasized flexibility in dealing with market-based changes in production and marketing opportunities and the resulting organizational implications for the Team, USAID/Nepal, and HMG. In view of limited project and HMG resources, the Team propose sustainable and self-reliant solutions to new problems. The Team encouraged project beneficiaries to take market-based approaches to community development problems, rather than counter-productive income transfers and subsidies. ***Within the bounds imposed by the MARD Grant Agreement between HMG and USAID, the Team modified its work plan as needed to address new, unanticipated problems and opportunities.***

C. Operational Approach

C1. Components

The Team's operational approach to achieving project performance objectives designed around a strategy for each component, a practical methodology for determining the most appropriate project interventions, and a practical methodology for setting performance benchmarks and targets.

C1a. Market Development

The TA Team focused its marketing assistance in three critical areas: 1) expanding demand for high-value agricultural commodities produced in the project area; 2) reducing the costs of marketing those products; and 3) expanding the supply of purchased agricultural inputs for those products. These initiatives worked to moderate the negative effects of general price declines that resulted from sharp production increases in an isolated market, and thereby maintained sufficient incentives for farmers to stay in the market. Expansion of demand for high-value agricultural commodities products is necessary to accommodate unfulfilled food needs within the project area, and to weaken the impact of increased production on local prices by exporting surplus goods to external markets (the rest of Nepal, and nearby Indian markets). An important part of the market expansion program is the development of niche markets for high-value products in the off seasons of relevant outside markets. Improved price information has to be available to farmers and traders if both groups are to make successful production and marketing decisions. Reducing the costs of marketing these products will affect the market in the same manner as if there were an increase in the supply of those products against a relatively fixed demand curve, where average market prices fall while the quantity of marketed goods increases. Similarly, expanding the supply of purchased agricultural inputs means lower input prices for larger quantities of marketed inputs, which directly increase agricultural production.

C1b. Technology and High Value-Agricultural Extension Services

The TA Team assisted farmers in adopting new technologies that increase product per unit of land, labor, and other significant production inputs. The technologies focused on: 1) improved crop varieties that have high fertility response, superior resistance to disease and pests, high consumer acceptability, and lower post-harvest handling losses; 2) crop varieties and cultivation practices that maximize off-season supply windows in export markets; 3) integrated pest management and environmental management approaches to reducing production costs; and 4) post-harvest reductions in processing and handling costs. These interventions have the combined effect of expanding the marketed quantity of products, at prices that are competitive outside the project area. Adoption of these interventions was facilitated by conducting crop demonstration sites with cooperating farmers in key production pockets throughout project production pockets.

C1c. Improved Nutrition

The TA Team promoted dietary diversification to accelerate improvement of the nutritional status of project pockets' pregnant and lactating women and children between the ages of 6 months and 5 years. The program was designed to be cost-effective, sustainable, sensitive to cultural and dietary traditions, combat multiple nutritional deficiencies, promote sustainable and environmentally sound food production systems, and establish a balanced relationship between consumers and producers, agricultural specialists, and nutritionists. To accomplish these goals, the nutrition strategy: 1) emphasized quality food production for home use; 2) provided an adequate nutrition knowledge base; 3) emphasized the importance of food storage and preservation to cope with lean production periods; and 4) carefully monitored and evaluated nutrition interventions to enhance program performance. Adoption of improved nutritional behavior was facilitated by conducting household nutrition demonstration sites with cooperating families throughout project production pockets.

C1d. Bottom-Up Planning, Co-ordination and Policy Issues

The Team promoted bottom-up planning, co-ordination and policy reform to improve farmer/trader beneficiaries' ability to: identify critical constraints to the full exploitation of their production and marketing resources; engage relevant HMG line agencies in constructive dialogues that promote an effective public-private partnership on local and regional rural development problems; identify new potential opportunities for project technical assistance in marketing, production, and nutrition improvement; develop local and regional solutions to policy problems that are within their local and regional influence; and develop local and regional coalitions to lobby HMG on solutions to policy problems that are outside their local and regional influence.

The Team conducted annual bottom-up planning exercises with farmer groups, traders, and agro-entrepreneurs in project production pockets to identify key production and marketing constraints and technical assistance needs. The results of these exercises were used to revise team work plans to address new problems and opportunities for accelerating achievement of performance targets.

The Team maintained a matrix to assess policy issues that were identified by the Team in the course of project implementation or through bottom-up planning exercises. Each policy issue was evaluated as to its market effects, relevant policy actors, appropriate policy

initiatives, necessary policy instruments, and advocacy campaign requirements. Market effects were highlighted by studying the specific problems of each issue in terms of their negative price/quantity effects on relevant markets. Policy actors were identified as the relevant groups of individuals and institutions with economic interests or influence in the issue. Policy initiatives are designed as program options for reducing or eliminating the specific problems, with assessments as to how the options relate to the policy actors. Policy instruments were identified as the specific regulatory instruments (laws and regulations) that reduced or eliminated the specific problems. Finally, advocacy campaigns were designed to: raise policy actors' awareness of the problems; mobilize relevant policy actors; design and promote effective policy initiatives; design effective packages of policy instruments for solving the problems; and monitor the implementation of policy initiatives to ensure effective resolution of the problems.

C1e. Monitoring and Evaluation

While this project had performance targets for agricultural production, marketing, farmer organizations, agro-enterprises, and nutritional status, it was not possible to simply report HMG statistics as the verification of these targets. First, published HMG agricultural production information is available only 6 or more months after the end of the project work plan year (HMG fiscal year), and would therefore be too late for inclusion in annual project reports. Second, there are no district level HMG secondary data series available to describe trends in agricultural marketing (prices and volumes), numbers of traders and micro-enterprises, and nutritional status. Finally, the raw HMG agricultural production data reported at the end of each fiscal year are not based on representative sampling methods, nor are the data available below the district level. These limitations required the TA Team to use a combination of rapid reconnaissance survey techniques to produce timely estimates of project performance indicators that were reasonably valid measures of actual changes in rural development conditions in project production pockets.

C2. Methodology for Project Interventions

The Team faced four major choices in determining the scope and nature of interventions that could be used to achieve project performance objectives. First, the commodities chosen for production and marketing support have to be justified according to market-based incentives for farmers and traders to adopt the Team's technical assistance recommendations. Second, the technical interventions chosen to support priority commodities have be justified according to their market-based incentives over alternative production and marketing approaches. Third, the production pockets, crop demonstration sites, and nutrition demonstration sites chosen to accelerate the diffusion of improved production technologies and nutrition practices have to be justified according to their potential for meeting agro-climatic, geographic, and cultural requirements for rapid adoption. Finally, the choices for the content of training programs have to be justified on the basis of the syllabi's direct support of project interventions and performance objectives.

C2a. Choice of Commodities for Production and Marketing Support

Based on the analysis and recommendations of MARD/Rapti Technical Report No. 17, the commodities that the Team decided to concentrate its TA were on following criteria:[2]:

[2] Larry C. Morgan. The Definition and Role of High-Value Commodities in MARD/Rapti. MARD/Rapti Technical Report No. 17, May 1998.

- the extent to which the commodity is already being produced;
- empirical evidence of superior technologies (farm demonstrations);
- empirical evidence of marketing trends and competitive advantages;
- the potential for short-term adoption of improved market and technology options; and
- the potential for long-term sustainability of TA well after the project ends.

Short-term commodity priorities were market-based, and consistent with a farmer's decision to adopt a production or marketing intervention based on the relative net returns to the family labor supply. This meant that commodities chosen for project emphasis will have to yield net returns to household labor that are substantially above the local non-agricultural wage rate, which was about Rs. 70 per day in both the Western and Midwestern Regions during 1996, according to the Central Bureau of Statistics' Nepal Living Standards Survey, 1996 (Vol. 2, p 48). Therefore, as a practical measure of labor opportunity costs and market development potential, the Team concentrated its TA efforts on commodities with net returns to a day of labor of at least Rs. 200 in Kaski pocket, and Rs. 100 in all other pockets. However, no TA were provided to rice, wheat, barley, millet, and open pollinated maize. The operating guidelines for determining which commodities meet the "high-value" criterion required the TA Team to:

- Give consideration to crops - vegetables and fruits, that have high sale volumes, higher off-season, early/late season prices, and can be produced/marketed during the project life period;
- Include grain or field crops in plans that represent typical farms in project production pockets because those crops dominate the current land use pattern – technical assistance will only be provided in those infrequent cases where the market and technology options demonstrate high potential net returns to labor;
- Avoid providing technical assistance to tree crops unless improved management practices on existing stands and market conditions demonstrate high potential for relatively high net returns to labor – this means the TA Team will not use technical assistance to promote new plantings which will not yield measurable net gains during the life of the MARD project;
- Avoid introducing new crop commodities that do not offer high short-term adoption and marketing potential, including developing a critical mass of farmers with adequate knowledge of basic production management and marketing practices; and
- Provide technical assistance through interventions in those commodities that offer the greatest chance of increasing agricultural production and sales in the project area.

Based on the above criteria, potato, cabbage, cauliflower, and tomato (PCCT) were selected as TA priorities during the third project year and continued for fourth and fifth project year also. Additional 8-10 vegetable crops and 2 fruit crops were promoted in the project area. These crops dominate the Butwal wholesale horticulture market (Table 5), where more than 75 percent of the annual volume is imported from India. Over the 6 project pockets, these crops also held a strong share of the 42 crops included in the 1998 benchmark survey (Table 6).

C2b. Choice of Production and Marketing Interventions

iThe choice of production and marketing interventions applied to priority high-value commodities were determined by practical, market-based comparisons of the changes in net returns to farmers and traders among alternative technologies and organizational approaches.

Enterprise budgets were maintained for priority high-value commodities to provide an economic basis for comparing the "with" and "without" effects of alternative interventions. The demonstration and diffusion program in the project pockets, combined with the additional demonstrations and diffusion programs planned by District Agriculture Development Offices (DADO)during the fourth and fifth project year, will be important factors in determining how many farmers adopt the demonstrated technologies in the project area, and how much of the "demonstration effect" is achieved by them. The 2001 (end of fourth project year) and 2002 monitoring survey results show sharp drop in incidence of women night blindness, increases number of Agro-vets and annual sales of PCCT over the 2002 target and actual result levels. However, because of lack of standard HMG/N data gathering practices that can be referred to at VDC level in the country, it is not clear how much of the difference between the two surveys is due to diffusion of same-year project demonstrations, sampling error, and poor weather effects during the benchmark year. Regardless of the true difference between the two years, drop in incidence of women night blindness and increase in per cent of PCCT marketed will still be a necessary condition for farmers to further improve their nutritional status (especially pregnant and lactating women) and market share of PCCT crops.

Table 5: Butwal Wholesale Horticulture Market Volume, 1997/1998

	Average Price (Rs/Kg)	Annual Volume (MT)	Total Value (Rs)
Potato	10.65	22,770	242,500,500
Onion	35.00	6,093	213,255,000
Apple	30.00	3,000	90,000,000
Tomato	15.64	5,550	86,802,000
Mango	30.00	1,800	54,000,000
Cauliflower	19.25	1,989	38,288,250
Cabbage	7.69	4,834	37,173,460
Chili (Green)	25.00	851	21,275,000
French Bean	15.50	765	11,857,500
Garlic	20.00	480	9,600,000
Banana	8.00	1,095	8,760,000
Radish	5.76	896	5,160,960
Orange	16.00	240	3,840,000
Ginger	12.00	120	1,440,000
Capsicum	18.29	39	713,310
Pineapple	5.00	120	600,000
Peas (Green)	N/A	140	0
Bottle Gourd	N/A	220	0
TOTAL	16.18	51,002	825,265,980

Source: James Diller, An Action Plan for Development of the Butwal Horticultural Market, MARD/Lumbini-Gandaki Technical Report No. 28, November 1998, Table 1, page 9.

Marketing interventions were assessed according to their impacts on marketing costs and volume of sales. Proposed interventions in packing, handling, and transportation were evaluated according to the potential for reducing marketing costs and expanding the volume of marketed commodities from the project area. Proposed interventions for developing

marketing centers were evaluated according to the potential for reducing marketing transactions costs and expanding the volume of marketed commodities from the project area.

Table 6: High-Value Crop Production & Marketing in Project Pockets, 1998 as Benchmark

1998 Benchmark Survey of HV Crops in All MARD Lumbini-Gandaki Pockets [a]

	Hectares	Tons	Yield (Tons/Ha)	Farm Price (Rs/Kg)	Production Value Rs '000	% of Production Marketed	Marketed Value Rs '000	Marketed Value Rank
Ginger	135	1,400	10.37	13.70	19,164	79	15,147	1
Potato	700	3,022	4.32	7.50	22,786	52	11,895	2
Cauliflower	156	1,463	9,37	10.80	15,864	73	11,634	3
Tomato	164	1,326	8.09	11.00	14,624	79	11,609	4
Lentil	1,148	632	0.55	18.00	11,385	72	8,242	5
Mustard seed	2,151	766	0.36	25.90	19,847	38	7,479	6
Cabbage	102	1,070	10.52	7.10	7,636	76	5,829	7
Banana	59	586	9.86	10.30	6,035	81	4,888	8
Orange	90	419	4.66	11.10	4,659	94	4,381	9
Brinjal	61	826	13.48	6.40	5,254	71	3,750	10
…	…	…	…	…	…	…	…	…
Total HV Crops	6,108	17,653	2.89	10.10	177,608	62	110,745	
Total Non-HV Crops	36,368	83,674	2.3	8.91	745,369	27	204,333	
Total PCCT	1,122	6,881	6.13	8.85	60,910	67	40,967	
Million US $ @ Rs. 65					0.94		0.63	

[a] MARD/Lumbini-Gandaki Performance Benchmark Data for the 2nd Project Year, 1997-98. MARD/Lumbini-Gandaki Technical Report No. 26, Nov 1998.

C2c. Choice of Production and Nutrition Demonstration Sites

Agricultural production and nutrition demonstration sites[3] were chosen according to their potential to maximize HV agricultural sales and improve nutritional status with respect to the Team's selected technical interventions. Site selection criteria were based on extension communications, agro-climatic, and marketing factors that establish complimentary training platforms for rapidly diffusing project interventions. However, to maximize the effectiveness of demonstration sites, they were located within production pockets that have the potential to rapidly transform TA into tangible results.

Production Pocket Selection Criteria – Production pockets were selected according to the following criteria:

- The pocket will be a contiguous area of one or more villages located entirely within one or more officially designated Village Development Committee areas;
- The pocket will be traversed by at least one motorable road, or will be located no more than 30 minutes in walking distance from at least one motorable road;
- The pocket will be free from ongoing security problems or disruptive community disputes within the VDCs, or the threat of security problems or disruptive community disputes elsewhere within the district;
- The pocket will be characterized by relatively homogeneous arable soils, farming systems (livestock and crop mixes), farm sizes,

[3] The locations of production and nutrition demonstration sites established during the second project year are shown in: Binod Tandukar and Santosh Acharya, MARD/Lumbini-Gandaki Project Pocket Maps, MARD/Lumbini-Gandaki Technical Report No. 44, July 1999.

Production Demonstration Site Selection Criteria – The selection of crop and livestock production demonstration sites were guided by the following criteria:

- The farm production site will be located within a project production pocket;
- The farmer-cooperator of the farmers group will be a community leader in seeking, testing, and adopting improved agricultural production technologies, other members of the group will also participate in the demonstration;
- The site will be centrally located, with easy access within the pocket, to allow nearby farmers to regularly observe site results and formulate their plans for adopting the demonstrated technologies;
- The number of sites will be limited to maximize technology diffusion to surrounding farmers in the pocket through intensive extension training and outreach programs focused on the sites.

Nutrition Demonstration Household Site Selection Criteria – Households were selected to demonstrate improved nutrition practices according to the following criteria:

- The cooperating household will be located within a project production pocket;
- The cooperating household will be a community leader in seeking, testing, and adopting improved nutritional practices;
- The household will be centrally located, with easy access within the pocket, to allow nearby households to regularly observe the demonstration results and formulate their plans for adopting demonstrated nutrition practices;
- The number of demonstration households will be limited to maximize technology diffusion to surrounding households in the pocket through intensive extension training and outreach programs focused on the demonstration households.

C2d. Choice of Extension Training Activities

The content of extension training activities were coordinated to complement and diffuse the technologies that were demonstrated at the agricultural production and nutrition demonstration sites, and the technologies that were necessary to expand markets outlets and reduce marketing costs for pocket production. The target audiences of these activities were beneficiaries of site demonstrations: farm households producing high-value commodities in project production pockets and the off-farm agro-entrepreneurs who supply farm production inputs and market farm products.

Exhibit 6 summarizes the TA Team's diffusion approach. In Phase 1, the TA Team is conducting crop demonstrations and household nutrition demonstrations in each of 6 project pockets. The results of the demonstrations were being diffused from the demonstration sites to all outlying farmers by organizing Farmers Field Days (FFD)in each project Village Development Committee (VDC). In Phase 2, the ultimate objective of MARD was to be achieved by diffusing results from project pockets throughout outlying non-project areas in each MARD district. Success in Phase 2 required robust results to be achieved in Phase 1, with HMG line agency extension staff collaborating closely with district MARD team members to apply MARD results in ongoing HMG on-site demonstrations, or create new demonstrations to accelerate the spread of appropriate technologies throughout all other VDC's in the district. The TA Team's extension program expedited this diffusion process by designing training programs that focus on critical technology issues and ensuring that many farmers in the project VDC have maximum exposure to the training. HMG line agency staffs

at district, service centers and sub-centers in MARD pockets were encouraged to participate in MARD extension programs and adapt those curriculums to fit extension needs in surrounding non-project areas.

C3. Methodology for Setting Performance Benchmarks and Targets

The methodology for measuring project performance is described in Section II.A and Exhibit 2 above. In this section, the methodology for setting performance benchmarks and targets is described.

C3a. Performance Benchmarks

The establishment of performance benchmarks requires 5 steps: definition of the project area; definition of high-value commodities; definition of performance indicators; estimation of the current level of each performance indicator at the beginning of the project implementation period; and estimation of future levels of each performance indicator without project assistance.

Exhibit 6: Diffusion of MARD Interventions from Project Pockets to Non-Project Areas

– **Definition of the Project Area**

The project area is defined as a series of production pockets. Each pocket is a geographic sub-area that includes one or more contiguous VDC s as the basic administrative unit for population and household data; production and marketing data enumerated by local agricultural service centers; and health and nutrition data enumerated by sub health posts. The characteristics of each pocket is determined by the criteria listed in Section IIC2 ("Production Pocket Selection Criteria") above.

– **Definition of High-Value Commodities**

In Section IICa above, the criteria are listed for determining whether commodities yield enough net returns to farm labor to justify the use of project TA.

– **Definition of Project Performance Indicators**

Project performance indicators are summarized in Section IIA above.

– **Estimation of Project Area Performance at Project Inception**

During the first two months after relocating to the Lumbini-Gandaki zone, the Team conducted a benchmark survey of each project pocket. VDC-level secondary data and pocket -level rapid reconnaissance methods were used to quickly estimate the levels of all agricultural production and marketing and nutrition performance indicators for the year proceeding the beginning of the project, 1997-1998. The 1998 benchmark data were used to measure the level of performance at "project start" in Exhibit 3.

– **Estimation of Future Project Area Performance without Project Assistance**

Trends in district-level production and marketing data over recent years immediately proceeding project inception would be used to forecast future levels of those respective performance indicators under the assumption of no project assistance to the area. Unfortunately, no such trend data are available for most of the indicators that are relevant to MARD program performance issues. In general, national agricultural production has grown at an average annual rate of between zero and 2 percent. This range of benchmark growth rates is expected to apply to the project areas.

C3b. Annual Performance Targets

The application of annual performance targets requires two distinct steps: setting targets that reflect reasonable project net contributions to project area development; and measuring annual end-of-project year performance against the respective targets.

– **Setting Annual Performance Targets**

During the first three months after relocating to the Lumbini-Gandaki zone, the Team set annual performance targets for each project pocket area, relative to the 1998 benchmark data[4]. The targets were set by a combination of two approaches. First, the TA team used

[4] MARD/Chemonics TA Team. MARD/Lumbini-Gandaki Performance Target Data for the Second Project Year, 1998-1999, MARD/Lumbini-Gandaki Technical Report No. 27, November 1998.

secondary data, rapid reconnaissance, and participatory rural appraisals to assess the priority commodities in each pocket (in terms of the "high-value" definition described above) with respect to the potential for narrowing the gaps between current yields and the yields that could be expected with typical farm adoption of recommended technologies and production practices.

Second, the annual percentage changes in production estimated under the first approach were compared with production trends targeted under Nepal's Agricultural Perspective Plan (APP) to arrive at a consensus annual performance target growth rate. The annual target growth rate adopted by the Team generally fell in the vicinity of 5 percent[5], which is the upper limit of the APP's national growth target over a 20 year planning horizon. However, the 1997-1998 benchmark data was considered to be on the low side because the year was not a normal year but a poor year. So Chemonics proposed a new set of performance targets which is based on 1998-1999 performance survey actual. This new set of targets was approved on August 2000 and became effective from 2001.

The above approach for agricultural commodities cannot be applied to nutrition performance indicators. Instead, because there are no national or local data on measures of nutrition knowledge or behavior, and little international consensus on the multi-year impact of nutrition program interventions on nutrition knowledge and behavior, the TA Team arbitrarily set annual targets of 5 percent improvement in those indicators, and the incidence of vitamin A deficiency. Because of the complex social and environmental barriers to rapid change, performance indicators for childhood stunting and wasting were eliminated as nutritional status indicators.

– Measuring Annual Performance Results

During each quarter, the Team will use available secondary data, rapid reconnaissance, and participatory rural appraisals to measure results toward the performance targets set for each project production pocket. However, the main measure of project performance will be an annual monitoring survey conducted each June under the same protocols as the 1998 benchmark survey.

C3c. Project Performance Benchmarks and Targets

In Rapti zone, the TA-Team followed the Performance Indicator Targets as per MARD Project Proposal and the benchmark was established through a pilot survey. However, during March-April 1999, the TA Team collaborated with the USAID/Nepal Strategic Objective 1 (economic growth) Team to determine the performance indicators and targets to be included in the MARD/Chemonics contract[6]. Ten indicators were chosen from the 1998 benchmark database (Exhibit 4). The TA Team proposed annual performance targets over 1999-2002. These data are summarized in Table 3 below. Actual results for 2001 are shown

[5] Annual production of high-value agricultural commodities was estimated to grow about 21 percent over 1998-1999, mainly due to unusually cold weather during December 1997 - February 1998.

[6] When the MARD/Chemonics contract was signed in April 1997, the performance indicators and targets had not been determined. USAID and Chemonics agreed to set the indicators and targets with benchmark data that were being prepared by the USAID-funded Regional Agribusiness Project (RAP). The RAP data were later found to be inappropriate for determining either performance indicators or benchmarks. The TA team then conducted a benchmark survey of Rapti Zone during December 1997-January 1998. The results of this survey were also found to unsatisfactory, as reported in: Ashok K.Vaidya and Santosh Acharya. MARD/Rapti First Year Project Performance. MARD/Rapti Technical Report No. 30, January 1999.

in the shaded column, based on the 2001 performance monitoring survey. The project district wise performance results are shown in Table 25. It should be noted that Indicators VIII (incidence of night blindness) decreased, VI (number of agro-vets) and I (annual sales of PCCT) grew much faster than the growth rates predicted (target) by the TA Team (Table 8). Part of the growth is due to farmers who concurrently copied interventions being demonstrated in nearby on-farm sites. However, since there are no trend data for these indicators, it is prudent to assume that growth rates during the fifth project year will be more in line with the actual growth rates of 2001.

The drop in incidence of night blindness among pregnant and lactating women (40.5%) considerably exceeded the target rate of -1.0 percent per year. As compared with last year actual figure, it is dropped by 28%. Nutrition knowledge and practice data from the 2001 monitoring survey are consistent with this lower night blindness level. The correlation evident from informal observations in all project pockets that the MARD nutrition training program has increased the levels of knowledge and practice/behavior, it remains highly doubtful that the true incidence of night blindness fell 40.5 percent (compared with target) in only one year. Since each pregnant/lactating woman was interviewed separately, there was little chance of group response bias. This means the most likely reason for such a low night blindness estimate is inadequate sample stratification within each VDC, i.e. disproportionately, more samples may have been drawn from households near the nutrition demonstration households and nutrition training sites.

C3d. Intermediate Performance Results During Fifth Project Year

Regardless of the formal performance indicators and targets shown in Table 8, other intermediate performance results were measured annually during the life of the project to provide more flexibility and interpreting performance results and identifying new TA opportunities. The following intermediate indicators were informally tracked by MARD TA Team:

Market Development

- operation of effective market information systems;
- operation of effective group-marketing/cooperative marketing of HV commodities;
- number of participants in marketing training programs;
- number of group gathering places the marketing groups are developing/operating in the project pockets.
- number of MGs that LA extension system will support after project closed;
- development of marketing groups into formal marketing co-operating

Technology and High-Value Agriculture Extension Services

- number of farmer groups strengthened and created;
- amount and level of hybrid technologies introduced and diffused;
- number of local resource persons developed through training programmes;
- increased knowledge, attitudes, and skills of farmers towards adopting high productivity technologies;
- number of farmers group members engaged in HVC production in clusters in project pockets,

- number of producer farmer groups that will operate on a sustainable basis even after project ends.

Improved Nutrition

- increased knowledge about night blindness causes and remedies;
- adoption of specific nutrition practices demonstrated in the nutrition action plan;
- identification of individual and group decisions that led to reduced incidence of night-blindness among pregnant women.

Bottom-up Planning, Co-ordination and Policy Issues

- increased participation in local bottom-up planning sessions;
- identification of local initiatives to solve policy problems or institutionalize MARD initiatives;
- incorporation of bottom-up planning methods at VDC level in agro-service center operations.

Table 7: MARD/Rapti Performance Indicators, 1996/97

Performance indicators (by USAID/Nepal strategic objective)		Pilot Survey 1995/96	Pilot Survey 1996/97
1.1 Annual HVC production (tons)		39,876	43,789
1.2 Annual HVC sales (US$ million)		8.7	9.44
1.1.1 HVC farmers	Male		
	Female		
	Total		
1.1.2 HVC traders	Male	4,094	4,592
	Female		784
	Total	4,094	
1.1.3 Off-farm enterprises	Micro	NA	NA
	% Female		
	Small	NA	NA
	% Female		
	Med-large	NA	NA
	% Female		
2.3 Improved nutrition status (d)			
% wasting, 6-60 months children			16.2
% stunting, 6060 months children			52.3
Night-blindness			
Nursing mothers (%)		13.5	12.4
Nursing mothers, prev, pregnancy			
Pregnant women (%)		11.7	13.5
Pregnant women, prev, pregnancy			

Table 8: Project Performance Targets for MARD/Lumbini-Gandaki: 1999-2002

Indi-cator No.	S. O.	Indicator Description	Indicators Established on June 1999						New Indicators Approved on August 2000*						
			Base 1998	Target 1999	Target 2000	Target 2001	Target 2002	% Award Fee	Indi-cator No.	S. O.	Base 1999	Target 2000	Target 2001	Target 2002*	% Award Fee
A-1	1.1	Annual sales of potato, cauliflower, cabbage,	0.63	0.64	0.77	0.93	1.11	10	I	1.1	1.35	1.51	1.69	1.84	20
		tomato in project pockets ($US million) [a]													
		(Annual growth rate, %)		2	20	20	20				114	12	12	8.52	
A-2	1.1.1	Farm household producing high-value ag.	33.9	34.6	35.3	36.0	36.7	5							
		products in project pockets (000) [b]													
		(Annual growth rate, %)		2	2	2	2								
A-3	1.1.2	Farmers producing high-value ag. products in	33.2	33.9	34.5	35.2	35.9	5							
		project pockets (000) [c]													
		(Annual growth rate, %)		2	2	2	2								
A-4	NA	Farmers groups assisted in project pockets	34	82	102	128	159	10	II	NA	91	102	128	151	10
		(number of groups) [d]													
		(Annual growth rate, %)			12	25	25					12	25	17.75	
A-5	NA	Hectares of potato, cauliflower, cabbage, and	1,122	1,133	1,224	1,322	1,428	10	III	NA	1,205	1,253	1,303	1,340	10
		tomato harvested in project pockets (hectare)													
		(Annual growth rate, %)		1	8	8	8					4	4	3	
A-6	NA	Average yield of potato, cauliflower, cabbage,	6.1	6.2	6.9	7.7	8.7	20	IV	NA	14.0	15.1	16.3	17.3	20
		And tomato harvested in project areas (ton/ha)													
		(Annual growth rate, %)		1	12	12	12					8.0	8	5.68	
A-7	NA	Percent of potato, cauliflower, cabbage, and	67	68	71	75	78	10	V	NA	68	71	75	78	10
		tomato production marketed (% sold)													
		(Annual growth rate, %)		1	5	5	5					5	5	3.55	10
A-8	NA	Number of Agro-vets operating in project	34	35	36	38	40	10	VI	NA	36	40	43	45	
		Pockets (number) [e]													
		(Annual growth rate, %)		2	5	5	5					10	8	6	
A-9	NA	Nutrition practices reducing the incidence of	48.6	51	53.6	56.3	59.1	10	VII	NA	59.8	62.8	65.9	68.3	10
		night blindness in project pockets (%) [f]													
		(Annual growth rate, %)		5	5	5	5					5	5	3.55	
A-10	NA	Incidence of night blindness in project pockets (%) [g]	14.7	14.6	14.4	14.3	14.1	10	VIII	NA	11.8	11.7	11.6	11.5	
		(Annual growth rate, %)		-1	-1	-1	-1					-1	-1	-0.75	
		Total						100							100

* Contract No. 367-C-00-97-00030-00, Modification No. 4, Annex 1. ** Project year 2002 (16 July 2001 -31 Mar 2002) is only 0.71 year, so the growth rate is adjusted accordingly, relative to the 2001 rate.

Note : The performance indicators were established in MARD/Chemonics contract modification no. 1, dated June, 1999. On January 10, 2000 the new performance indicators were proposed to USAID and approved on August 2000 to be effective for the years 2001 and 2002. The 1999.

[a] The 1998 benchmark and target are based on an exchange rate of Rs 65 = 1 $ US, and a 1998 base of Rs 40,968,000. The 1999 actual results are based on exchange rate of Rs 67.67 = 1 $ US, and a base of Rs 91,342,000.

[b] The 1998 benchmark was estimated as 90% of the 37,624 households reported in the project pockets, or 33,900 households, based on the assumption that 10% of the households are not farming, and all the farm households are producing at least one high-value agricultural commodity. The 1999 result is 1998 benchmark, inflated by the HMG estimated weighted annual population growth rate for the project districts, i.e. 2.52%. Note: The 1998 benchmark was based on total households/population reported by HMG line agencies/VDC secretaries. In the 1999 monitoring survey, these same sources reported a total population increase of 29% an implausible growth rate for these pockets.

[c] The 1998 benchmark was estimated as 98% of the benchmark household number. (In Rapti, 98% of farm households were estimated to be producing high-value commodities). The 1999 results are the 1998 result, inflated by 2.52%, as in the case of households above.

[d] During 1999, the TA team created and assisted 47 new farmer organizations, & assisted 9 more previously unidentified organizations, in addition to the 34 organizations identified in the benchmark survey, for a total of 91 organizations assisted during 1999.

[e] The number of Agro-vets found in benchmark survey (Nov 1998) are reconciled in the case of Palpa and Kaski Districts.

[f] Scores based on 0-100 scale were estimated by randomly selecting 10 pregnant or lactating women in each MARD VDC. The nutrition practices score was estimated by calculating the percent of correct answers to 6 questions on food-based nutrition practices that reduce night blindness. The night blindness score was estimated as the percent of positive responses when asked if they are currently suffering night blindness, or suffered night blindness in their last pregnancy. Detailed explanations of nutrition performance indicators are found in: Parvati Shrestha and Larry C. Morgan, *The Impact of Improved Nutrition Knowledge and Practices on Night Blindness in MARD Project Areas*, MARD/Lumbini-Gandaki Technical Report No. 33, March 1999.

[g] 1999 baseline values are based on 1999 result except for indicators A-9 and A-10, where benchmark & 1999 actual value are averaged.

SECTION III – PROJECT IMPLEMENTATION

Major activities in market development, technology and improved agricultural extension, nutrition improvement and bottom-up planning, co-ordination and policy issue components are summarized in Annex-1. Almost all the planned activities were fulfilled.

A. Rapti

A1. Market Development

A1a. Group Marketing Strengthening

Project organized several meetings (attended by farmers, line agency, district co-operetive office, Sallyan, VDC etc) at Kapurkot to promote group marketing. At the initiative of the TA Team, District Agricultural Office, Sallyan and District Co-operative Office, Sallyan an Ad-hoc Committee of Farmers Groups representing 29 Production Marketing Associations (PMAs) were constituted to promote group marketing of HVC. Several members of the executive committee were provided training on marketing management and were taken in the Market linkage tours in India and in Nepal.

A1b. Market Outlet Development

Important contribution was made in the development of the Kapurkot periodic market in Sallyan through training, tours, marketing extension leaflets, MIS, providing 176 plastic crates for reducing post-harvest loss, establishing and strengthening marketing group, regular field visit and interaction with the commercial farmers of the area etc. These plastic crates helped farmers to transport their produces (tomatoes) to the markets like Butwal, Kathmandu, Narayangarh etc. at less loss and at reduced transport cost per unit.

Periodic market (hat bazaar) established at the initiative of the Project MARD at Bijuar, Pyuthan was used as collection center of local production as well as helpful in promoting commercial production and sales of HVC in that area.

Similarly, at the joint initiative of the TA Team and MARD/PCO, Chamber Of Commerce, Mayor of Tulsipur and farmer groups, **a new haat bazaar was established at Tusipur**, Dang. MARD/TA prepared and distributed publicity posters/leaflets for the opening of the Haat bazar.

A1c. Market Information System (MIS)

MIS was established for the benefit of commercial farmers and traders. Price Information Boards (PIBs) were installed at the markets of Kapurkot, Sallyan and Bijuar, Pyuthan. Price information of major commodities of 8 major markets like Butwal, Pokhara, Nepalgunj, Narayangarh, Krishnanagar, Hetauda etc. were collected regularly and disseminated to the farmers to help them make marketing decisions. Similarly, market arrival of different commodities at the Kapurkot market was collected and disseminated. Name and address of different key wholesalers of major markets of Nepal (related to Rapti area) were collected,

updated and were distributed to related leader farmers, wholesalers of different markets. Thus, **marketing information systems were improved**.

A1.d Marketing Skill/Entrepreneurship Development (Marketing Training)

Several district level/project level training conducted on marketing **helped enhance knowledge and skill on marketing of HVC of leader farmers, line agency staff, project staff agro-entrepreneurs etc.** One training on "Agro-Entrepreneurs Development and Marketing Management" was conducted for 21 agro-entrepreneurs/commercial vegetable growers, Agro-vets etc jointly with Agro-enterprise Center, Tulsipur on December 17-19 at Lalmatia, Dang.

A1e. Marketing Study/Observation Tours

Several market observation tours were organized in Nepal (for commercial farmers, agro-entrepreneurs, government officers, project staff etc). Similarly one market tour was conducted in India for 28 commercial farmers, agro-entrepreneurs, government officers, project staff etc. **These tours enhanced knowledge of market windows and helped to establish market linkages for the farmers** of Rapti with traders/commission agents of markets like, Butwal, Pokhara, Nepalgunj, Tulsipur, Krishnanagar, Narayangarh, Kathmandu etc in Nepal and Gorakhpur, Baharaich, Faijabad etc in India for vegetables and vegetable seeds.

Two linkage tours were organized for the 40 farmers of Sallyan, and Rolpa in July 1997 (when there was glut of tomato at the Kapurkot hatbazar) to the market of Butwal and Bhairawa. This tour helped establish linkage with the traders wholesalers of Butwal and Bhairawa for the farmers. Similarly Project helped organize one tour for the farmers of Bijuar with their produces at Butwal market. Such activity helped establish linkage with the market.

A1.f Contract Marketing Workshop

Three Marketing Workshops were organized (participated by major vegetable seed dealers of Nepal, leading agro-industrialist and major commercial seed growers of Rapti) to promote contractual production of vegetable seeds and commercial production of maize, soybeans etc. Seed Marketing Workshop organized in October 22-23, 1997 helped sign contract production of 60 mt of vegetable seed (mainly radish seeds) between peed producing farmer groups and seed companies/traders from different parts of the country.

Similar Seed Marketing Workshop organized in May 22-23, 1998 helped sign contract of vegetable seed production amounting 82.37 mt. between Rapti zone seed producers and buyers from outside Rapti zone. Likewise, Workshop on contractual production of maize, soybean for agro-processing industry, probably first of its type in the region organized in May, 1998 at Lalmatiya Dang was participated by Agro-Industry of Birgunj which offered to purchase 20000 mt of improved maize. A contract of 500 mt of maize was signed between the farmers groups and the Agro-industry. **Thus MARD had attempted to establish and strengthen linkage between the producers and the agro-processing industry which is generally neglected/over-looked in Nepal.**

A1g. Short Term Consultancies

Completed a study on major potential crops for export to India (by Short Term Marketing Consultant Dr. A.P. Kulkarni hired in June, 1997).

A1h. Support to PMAs, Agro-Entrepreneurs, etc

Training and tour organized by the Project was helpful in improving the farmers post-harvest handling practices leading to decrease in losses of perishable vegetables like tomato in particular. Project provided (on rent) 176 units of plastic crates (received from local RADCO Company, Tulsipur) to the commercial tomato growers of Kapurkot area and jointly with Agricultural Service Center, Kapurkot arranged distribution of these crates on rent to farmers/group members of the locality.

Three new agro-vets were promoted at the initiative of the Project staff in Pyuthan. Agro-vet licensing training was conducted for 25 potential Agro-vets.

A2. Technology and Improved Agricultural Extension Services

A2a. Technology

A2a1. On-farm Demonstrations

A2a1a HV Crops

On-farm demonstration has been one of the best effective extension tools carried out by the TA Team for increased adoption and diffusion of new technologies with the principle of "Seeing is Believing" and "Learning by Doing". Over 400 OFD on more than 23 HVCs involving 2025 cooperator farming households were carried out during FY 1997/98 in Rapti (Table 9). Major HVCs included Cauliflower, Cabbage, Chilli, Capsicum, Tomato, Onion, Potato, Soybean, Cowpea, Blackgram, Sunflower, Hybrid maize, Papaya, Fodder/forage, French bean, Dhaincha, Mustard, Chickpea, Pea, Radish, Eggplant, and Ginger etc. In addition, OFD on banana and papaya were also initiated. These OFDs clearly demonstrated increased productivity in these crops and farmers adopted these new technologies and benefited economically.

Table 9: Summary of OFD Conducted During FY 1997/98 in Rapti

S.N.	District	Pockets	No. of OFD	Major HVCs
1	Dang	Lamahi	98	Tomato, cauliflower, cabbage, potato, radish, hybrid corn, papaya, beans, sunflower, lentil, chickpea etc.
		Tulsipur	53	
		West Tulsipur	20	
		Ghorahi	6	
	Sub total	***4***	***177***	
2	Salyan	Kapurkot	79	
		Bhotechaur	19	
		Tharmare	21	
	Sub total	***3***	***119***	
3	Pyuthan	Bijuwar	49	
		Machhi	20	
		Devisthan	41	
	Sub total	***3***	***110***	
Grand Total		**10**	**406**	

A2a1b. Livestock

Forage grass OFD for summer and winter conducted and the result was encouraging.

A2b. Improved Agricultural Extension Services

A2b1. TA Intervention Sites

MARD activities were carried out in ten pockets with 189 sites covering 51 VDCs and 2 municipalities in 3 districts: Dang, Salyan and Pyuthan (Tables 2 and 10). District co-ordinators and motivators were responsible for carrying out MARD interventions in the district supported by Subject Matter Specialists, Field Activity Coordinator and Team Leader from Tulsipur Office.

Table 10: MARD Intervention Sites in Rapti

S.N.	District	Pockets	No. of VDCs/NPs	No. of Sites
1	Dang	Lamahi	6	21
		Tulsipur (A)	8	29
		West Tulsipur (B)	4	23
		Ghorahi	1	4
	Sub total	***4***	***19***	***77***
2	Salyan	Kapurkot	4	26
		Bhotechaur	5	14
		Tharmare	7	23
	Sub total	***3***	***16***	***63***
3	Pyuthan	Bijuwar	5	19
		Machhi	6	16
		Devisthan	5	14
	Sub total	***3***	***16***	***49***
Total		**10**	**51**	**189**

A2b2. Farmer Groups Formation and Profile Preparation

In Rapti, 249 farmer groups involving 3449 household members with about 26% female participation were formed and their profiles were prepared (Table 11). Technical assistance was provided to the farmers groups in many ways, which resulted in increase in their HV products and sales.

Table 11: Farmer Groups Assisted in Dang, Salyan and Pyuthan

District	Production Pocket	VDC/ Municipality	No. of Site	Farmer Group				Nearest Market
				No.	Households Covered			
					Male	Female	Total	
Dang	4	19	77	85	1049	287	1336	5
Salyan	3	16	63	90	978	329	1307	11
Pyuthan	3	16	49	74	507	299	806	6
Total	10	51	189	249	2534	915	3449	22

A2b3. Training

Four training approaches in Rapti included:

1. "Integrated Training Approach" (ITA) was used in Rapti, which included 5-7 days training on production technology, marketing and nutrition aspects for motivators and leader farmers. The purpose was to enrich technical know-how of motivators to enable them work more efficiently in the field. ITA was also used to develop local resource persons from leader farmers as "Farmer Trainers" (FT) as key agents to transfer/diffuse the technologies by conducting a series of trainings at farmers group level.

2. "Specialized Training" for 1-3 days was used for selected HVCs/marketing/ nutrition/enterprises to satisfy the specific training needs identified and prioritized by the beneficiaries.

3. "Informal Training" was conducted at the farmer's field level by DCs, Motivators and SMS.

4. Training by "Farmer Trainers" at the farmer group level.

Major trainings conducted in Rapti are summarized in Table 12 below. Details are provided in Annex-2. Integrated training included 2 motivators trainings for 23 trainees and 5 trainings for 138 leader farmers. Specialized training included agro-entrepreneurs (21 trainees) commercial poultry (8 trainees), dairy product processing (8 trainees), vegetable seed production (19 trainees), agro-vet (25 trainees), IPM (25 trainees), M&E data collection (16 trainees) and vegetable seed production and quality control (25 trainees).

Support to Rolpa and Rukum districts included three trainings to 70 leader farmers on off-season vegetable production, vegetable production and post-harvest handling of vegetable seeds organized from Tulsipur office. In addition, 50 "Farmer Trainers" developed through ITA conducted 76 trainings at farmers group level for 1144 farmers.

A2b5. Livestock Production Program

Giriraja breed of poultry promoted in rural areas and 2 pig resource centers established to promote pig raising. These activities helped farmers to increase their income through selling eggs and meats as well as selling piglet to neighboring pig grower farmers.

A2b6. Observation Tours/Visits/Fair

Farmer tours conducted in Rapti included 17 participants from Salyan and 22 participants from Dang to MARD pockets of Pyuthan. Similarly, 38 leader farmers of Pyuthan visited demonstration plots in MARD sites in Pyuthan district. These tours helped farmers interact with each other, exchange ideas and exchange of seeds especially cowpea was remarkable.

Table 12: Summary of Trainings Conducted During FY 1997/98 in Rapti

S.N.	Activities	Target Group	No. of Training	No. of Participants			Remarks
				Male	Female	Total	
A. Integrated Training							
1	Motivators training	Motivators	2	4	19	23	
2	Leader farmers (LF)	LF	5	103	35	138	Dang - 3, Salyan - 2, Pyuthan - 1
B. Specialized Training							
1	Agro-entrepreneurs	AE	1	20	1	21	
2	Commercial poultry	Farmers	1	8	-	8	
3	Dairy product processing	Farmers	1	8	-	8	
4	Vegetable seed production	Farmers	1	17	2	19	
5	Pesticide reseller (Agro-vet)	Farmers/ Agro-vet	1	25	-	25	
6	IPM	LF, M, DC	1	20	5	25	
7	M&E data collection	M, LA OJT	1	11	5	16	
8	Vegetable seed production and quality control	Horticulturist / Specialists	1	-	-	25	
C. Training for Rolpa & Rukum							
1	Off-season vegetable Production	LF	1	19	6	25	Rolpa farmers
2	Vegetable production	LF, OJT	1	20	6	26	Rolpa farmer
3	PH handling of veg. Seeds	LF, OJT	1	18	4	22	Rukum & Salyan farmers
D. Training at Farmer Group Levels by Farmer Trainers							
	Dang	Farmers	16			205	
	Salyan	Farmers	54			849	
	Pyuthan	Farmers	6			90	

Other tours included production and marketing tour in Nepal (38 participants) and Indian market tour (28 participants). In addition, high level officials from HMG and USAID/N also visited to the MARD pockets in Rapti..

Women Development Office, Dang organized one day fair at Ghorahi, where MARD-TA displayed the sources of Vitamin A from plants and animals at the exhibition and also distributed 1000 pamphlets on the sources of Vitamin A. This created huge interest among the visitors and more than 3000 persons visited the MARD stall.

A2b7. Mobilization of On-the-Job Training (OJT)

As interns, 8 OJT students coming from Rapti Technical School (RTS), Lalmatiya, Dang were mobilized to carry out MARD TA field activities starting Jan. 25, 1998 until June 26,

1998 for 5 months. These 8 OJTs comprised of 3 female and 5 male trainees (crops and livestock). Out of these OJTs, 3 were deputed in Dang, 3 in Salyan and 2 in Pyuthan districts in MARD TA intervened pockets. These OJTs were found very useful and effective in carrying out TA field activities. As agreed these OJTs were evaluated and sent back to RTS, Lalmatiya after successfully completing their internships.

A2b8. Publication/Reports/Highlights/Documentation

In FY 1997/98, a total of 56 reports including 5 Performance Reports, 19 Technical Reports, 10 Training/Tour Reports, 20 Workshop Reports and 2 Manuals were published.

In addition, more than 100 different kinds of extension materials such as booklets, bulletins, leaflets, charts and posters etc. related to MARD TA interventions mainly on crops, livestock and nutrition were assembled from different sources and were used as extension training materials in the project area. Some of the extension materials were also developed by the TA Team.

A3. Improved Nutrition

a. Training

Nutrition education trainings tied with knowledge, attitude and practice (KAP) provided to more than 800 farmers, leader farmers, farmer group's members and motivators. The training helped them improve their existing nutritional status.

b. Pilot Nutrition Study

From December 1997 to January 1998 the MARD team conducted a pilot nutrition study in the Rapti zone. Twelve sample villages were selected from a list of 80 villages representing the four altitude strata in each of the 5 districts. The survey indicated that the prevalence of stunting is 52.3% and wasting 16.2%. (These results compare to prevalence of 65% and 11%, respectively, in the RAP survey). Night blindness in the prior pregnancy was reported by 13.5% of the women, and in the previous lactation by 12.4% of the women. Night blindness was most prevalent in Salyan (40% in pregnancy and 47% in lactation), and consistent with the poorer nutritional state of this district.

c. Short Term Consultancies

c1. Review of Nutrition Baseline Data

MARD subcontractor UC/Davis completed an analysis of the original baseline survey that was conducted in the Rapti Zone by the RAP project. The RAP study analyses show that the main dietary problems that lead to this pattern of nutrient deficiencies are: (1) a low intake of animal products which are high in available iron, calcium, vitamin B-12, riboflavin, preformed vitamin A, zinc and copper; (2) over-reliance on polished rice which is low in thiamin and niacin; (3) a low intake of fruits and vegetables which are sources of vitamin C and carotene; and (4) a low intake of fat, a source of vitamin E and necessary for the absorption of carotenoids from plant improving nutrient intake can be achieved by increasing the production and consumption of (1) animal products, especially liver, eggs, other meats, and dairy products, and (2) fruits and vegetables, especially pumpkin, sweet potato, yellow

yams, ripe papaya and citurs. The results obtained from food intake data analysis were incorporated in the TA Team's nutrition training program.

c2. Food Beliefs and Practices Study

During December 1997 and January 1998, the MARD team and STC conducted a study on food beliefs and practices in the three Rapti districts: Pyuthan, Salyan and Dang. **The study identified beliefs and practices deemed to be harmful** (e.g. women do not think it is necessary to consume more food during pregnancy; colostrum is often thrown away; night blindness is considered a normal part of pregnancy, etc.) as well as those deemed to be beneficial (after birth a mother is given special foods, including animal products, for approximately 11 days; most women breast-feed exclusively for 6 months and partially for upto several years, etc.). **The findings clearly demonstrated the need and opportunity for nutrition education in the project area.** Nutrition education messages focus on (1) emphasizing the need for production and consumption of vitamin 10 and iron-rich foods, (2) improving nutrition in pregnancy and lactation, and (3) improving infant feeding. **The focus group responses also demonstrated the need to increase the production and consumption of animal products, fruits, and vegetables.** Introducing practical methods for food preservation and storage was also deemed necessary.

A4. Bottom-up Planning, Co-ordination and Policy Issue

A4a. VDC/Municipality Level Bottom-up Planning

Ten Bottom-up Planning workshops (one in each pocket) were conducted to identify and prioritize local needs by the farmer groups themselves in order to formulate annual work plan for the MARD/Chemonics TA Team. Key participants included farmer groups, local leaders, line agencies, VDCs, Agro-vets, traders, CBOs/NGOs, other concerned development workers in the pocket and MARD-TA Team. Altogether, 702 persons participated in 10 BUP workshops (Annex-4).

A4b. Co-ordination

Workshops/Meetings

Major workshops included Start-up Workshop, Annual Planning and Budgeting Workshop, Annual Progress Review and Implementation Workshop, Marketing Workshop Contract Farming Workshop and Seed Marketing Workshop jointly organized by MARD-TA Team and MARD/PCO.

Major meetings held during this period included MACC meeting (4 times) to coordinate and help smooth and effective implementation of MARD activities in the districts. Steering Committee Meeting held 5 times helped making decisions at the high level policy matters. Monthly meeting between MARD/PCO and MARD TA Team at the project level and between district LAs and DCs continued for effective implementation of MARD activities (Annex-4).

A5. Monitoring and Evaluation

A5a. Performance Indicator Targets

Several intervention activities on market development, technology and improved agricultural extension services, improved nutrition and bottom-up planning, co-ordination and policy issues were implemented as mentioned above which should result in achieving the performance indicators targets (by USAID/Nepal strategic objective) as shown in below Table-8. At the time of the RAP MARD benchmark survey, the format for all performance indicators under strategic objective 1 was available from the MARD grant agreement between HMG and USAID. The nutrition indicators had not been fully defined when working in Rapti. The Table-7 indicates some of the difficulty in converting the RAP survey results into project performance benchmarks. The monitoring figures in Table 20 suggest a decline in number of traders when compared to pilot studies, possibly due to failure in collecting data from required samples in MARD areas, which have higher probability of traders operating.

A5b. Pilot Survey

A pilot survey was conducted during December 1997-January 1998 in five districts of the Rapti zone to produce estimates of performance indicators for the year 1996/97 and 1997/98. This survey provided geographically relevant estimates of USAID performance indicators that were not available from the RAP MARD benchmark survey. The data collection tools were refined during the pilot survey. Summary results of the pilot survey are presented in Table 11.

A5c. Annual Performance Monitoring Survey

As a follow-up to the pilot survey, the MARD/Chemonics TA Team conducted a monitoring survey during May 1998. This survey was only conducted in Salyan, Dang and Pyuthan districts. The survey in the MARD activity sites were implemented by respective DCs but couldn't be completed before the decision to withdraw project activities in Rukum and Rolpa due to existing security situation and possible sensitivity of the fact that project collects data without project interventions. During the survey, the enumerators in the control area identified village recorders but the training program for the village recorders also had to be suspended.

A village-based sample monitoring system in non-activity area was being implemented using village-based local recorders before the project was re-located to the Lumbini-Gandaki area.

A comparison between pilot and monitoring survey aggregate-level estimates for Salyan, Dang and Pyuthan provides a perspective on static and dynamic effects. The results are discussed in major accomplish of Rapti in section V.

A5d. Training

Training on monitoring and evaluation data collection provided to 16 participants (Motivators, LAs staff and OJTs) which helped participants to familiarize about qualitative data collection especially through PRA methods.

A5e. Workshop

A one-day workshop with VDC Secretaries was organized to define broad domain in each of five districts using participatory approach and the VDC level data base for the Rapti Zone developed which included socio-economic, institutional and bio-physical factors at the village level.

A5f. Monitoring of the Project Activities

Beside monitoring and evaluating the project activities through annual PRA survey, project's field activities were monitored thorough frequent field visit, interaction with TA Team staff, LAs staff and project beneficiaries. It helped the project management to implement the intervention activities in a planned way.

A5g. Progress Reporting

Computerized database used to monitor and generate information for the quarterly and annual performance monitoring reports. It was also used to up-date indicators, as well as track progress of the project activities that promote changes in the indicators.
The tracking of project intervention activities helped in using project resources efficiently.

A5h. Secondary/Field Data/Information Collection and Processing

In-order to facilitate the TA Team and the concerned parties in implementing project intervention activities, project's relevant secondary, field data, information were collected and processed, and provided to them as and when needed. Market center surveys for selected high value commodities were initiated. Data were collected for enterprise budgets and whole-farm planning. Various information were utilized addressing agricultural policy issues also.

B. Gandaki-Lumbini

B.1 Market Development

B1a. Group Marketing Strengthening

Fifteen Marketing Groups were formed in the 6 production pockets of the MARD project area. MGs are selling their production through group marketing in the local as well as in the distant markets. Madanpokhara MG have registered as a HVC Marketing C-operative. MGs status are presented in Table-13.

MGs have conducted more than 160 group meetings with the participation of the MARD staff. The regular meetings helped them more organized in group marketing.

Likewise, 27 co-ordination meetings of MGs were conducted to strengthen the linkage between the wholesalers of major markets and the MGs. Marketing extension material set was provided to MGs to help strengthen group marketing.

B1b. Marketing Skill/Entrepreneurship Development Training

Training on market management to Agro-vets (1 time) and commercial farmers (45 times) were provided altogether for 1065 participants.

Table 13: Status of Marketing Groups (As of July 2000 - Sep. 2001)

Name of District	Name of Marketing Group/Date of Establishment	No. of Production Groups Covered	No. of HH Served	Location of Marketing Group	Major Market Centers	Volume Sold by Marketing Group (July 16, 2000 -July 16, 2001)	
						Qty (Mt)	Value (Rs. '000)
Rupandehi	Lumbini Production and Marketing Group (27-6-2056)	6	109	Khudabagar VDC	Butwal, Local Haat bazars, Bhairahawa	380.71	3351.7
	Lumbini Production and Marketing Group (2057-7-1)	6	120	Chapiya, Dayanagar	Butwal Local Haat bazar, Bhairahawa	163.4	867.8
Kapilvastu	Siddhartha Veg. MG (2057-3-13)	3	48	KNP	Taulihawa, Local Haat bazaars	97.5	779.25
	Nigali Veg. Marketing Group (2057-1-29)	4	78	Jagdishpur	Taulihawa Local Haat bazaars	19.7	151.6
	Dhankauli Veg. Marketing Group (2057-1-28)	3	37	Dharmpur	Taulihawa Local Haat bazaars	NA	NA
Nawalparasi	Women Veg. Production and Marketing Group (2057-4-20)	3	85	Shitalnagar	Narayangadh Butwal Local Markets	18.06	77.6
	Rajahar Veg. Production and Marketing Group (2057-2-27)	2	33	Kujauli	Local Markets	21.72	169.6
	Beldiah Veg. Production & Marketing Group (2058-4-32)	9	152	Beldiah	Local Markets/ Narayangarh	NA	NA
Palpa	Madanpokhara Veg. Production and Marketing Group (2056-5-10)	5	74	Madanpokhara-8	Butwal, Bhairahawa Local haat bazaar	660.2	5265.3
	Shramjiwi Veg. Production and Marketing Group (2058-2-10)	6	77	Dumre Masyam	Butwal	10	77
Syangja	Triyasi Veg. Producers Marketing Group (2056-5-2)	7	146	Triyasi	Butwal Pokhara Local markets	385.13	6904.6
	Andhikhola Veg. Marketing Group (2057-3-23)	6	71	Bayarghari Dahathum	Butwal & Pokhara Local markets	57.04	636.4
Kaski	Bagmara Fruits and Vegetable Marketing Committee (2057-1-7)	7	192	Bhagwatichau-tara-4	Pokhara Local Markets	140	2424.6
	Lamgadi Krishi bazar Samuha (2057-4-17)	4	61	Lamgadhi	Pokhara Local Markets	23	296.3
	Lekhnath Agr. Marketing Group (2058/6/13)	13	200	Dhalepipal, Lekhnath	Pokhara/local market	NA	NA
Total	**15**	**84**	**1483**			**1976.46**	**21001.75**

Note: Sold quantity and value of 3 MGs in Kapilvastu, Nawalparasi and Kaski not available (NA).

Four Agro-vet licensing trainings conducted for 119 potential agro-vet entrepreneurs, were followed up by several interaction meetings that helped many trainees to start their own Agro-Vet shops.

Training on group marketing was provided too project Motivators and JT/JTAs of LAs two times for 37 participants.

Post harvest handling training was provided to project Motivators and JT/JTAs/Las of and marketing groups' members (organized 19 times altogether) for 386 participants).

One training on Record Keeping was provided to the 28 key members of the 15 MGs operating in the Project area.

B1c. Marketing Study/Observation Tours

Market linkage tours were organized 31 times altogether for 343 marketing groups' members.

Interaction tours/visits were organized 17 times altogether for 179 marketing group' members.

Post harvest loss assessment tours were organized 5 times altogether for 34 participants.

Project level traders/tours visit was organized twice altogether for 11 participants.

Cross-border study/tour of selected Indian vegetable markets was organized in Dec, 2001. MGs' members, DCs and MS, altogether 11 persons participated in the study/tour.

B1d. Workshops

The TA-Team organized a Nutrition Workshop with active participation of project area women farmers, housewives, District Ag. Offices, District Public Health Offices, Regional Directors in Health, Agr., and 4 STCs including 3 from UCD and 1 from VOCA.

Post-Harvest Technology Workshop was conducted with the co-operation/support of Nutrition Specialist, 4 short-term consultants (STC) including 3 expatriates from VOCA, UC Davis. Commercial farmers, agro-processors, Nutrition Demonstration Households, LAs etc. took part.

A Nutrition Intervention Action Plan was prepared in the workshop for implementation in the project area.

District Level Integrated Workshop to create awareness and to promote MARD project activities was organized in each 6 project district in 2000/01 (in 5 districts) and 2001/02 (in 1 district). MGs' members, production groups' members, Agro-vets, LAs staff, traders, etc. participated in the workshop, altogether 383 participants.

Organized jointly **HVC Production and Marketing Workshop** with MARD PCO at RATC, Bhairahawa in 2000/01 to promote production and marketing activities to District Line Agencies, farmer groups and trader groups.

B1e. Short-term Consultancies

One STC (Expatriate) was hired to develop**" Practical MIS Program"** in Project area and report submitted (Tech. Report No.31). Wholesale prices, analysis of price trend, marketing cost estimate, break-even yield etc also covered and analyzed for different crops, for different production pockets to markets etc. Based upon the suggestion necessary improvements in MIS are being made.

Profile of the agro-entrepreneurs/seed-dealers of markets of Nepal and India was prepared. Preparation and distribution of "Seed, Agri-input Marketing Directory (Tech. Report. No.30) to farmers, agro-vets and related institutions.

Co-operative Seed Buying Consultancy: One local STC hired on Seed Buying Consultancy. Report of consultancy submitted.

HVC Post-harvest Technology Consultancy (Handling, Packaging etc): 4 short term consultants including 3 expatriates from UC Davies, VOCA were hired and Action Plan prepared and distributed to related agencies and persons.

Co-operative/Group Product Selling Consultant: An expatriate STC and MARD/TA Specialists jointly prepared "Market Demonstration Program Report" (MARD Lumbini-Gandaki Tech. Report No. 63.).This Report focused on ways of strengthening the Group Marketing approach of the Project in carrying market development activities. Based upon the findings of this Report guidelines were made and executed for the formation of the Marketing Group (MG) from several Production Groups (PG) of certain geographical area/cluster. Similarly, guidelines were developed for strengthening the MGs and replication of the successes of the first 3 MGs supported by the Project in other production pockets and even in the areas outside the Project area by the Line Agencies.

B1f. Other Major Supportive Activities

Necessary linkage and co-ordination being made with related agencies like line agencies, Agro-enterprise Centre, Kalimati Wholesale Market project in exchanging price information and consultation in related matters.

Completed mini-study on "Development of Criteria for Collection Center Development" (MARD L-G Technical Report No.86.1) by a team of experts from MARD/PCO, Line Agency and the MARD/TA Team. The findings of this study were very helpful for making selection of collection center; for construction of low cost sustainable collection center in the production pocket on partnership basis with different parties including the user-farmers groups. It was found that even simple low cost collection shed (with weighing scale and plastic/corrugated roof shed) can effectively help collection and sales of high value commodity of farmers groups if they are located at suitable places, properly managed by the primary stake holders and if there is sufficient production in the area.

B2. Technology and Improved Agricultural Extension Services

B2a. Technology

B2a1 On-farm Demonstration (OFD)

i. HV Vegetable Crops

In Lumbini-Gandaki project area, 1,422 OFDs on different hybrids and improved HV vegetable crops varieties were conducted successfully during the four year of project period (Annex __). Seeds of OFD were provided not just to the group leaders but to all the members of group since 2000/01. Cost of seeds was reimbursed by the forms group and deposited in their group fund. It popularized the F1 hybrid varieties in MARD areas. The OFD results demonstrated very high yield potential although yield levels varied from one high site to another and according to season of planting. Farmers' preference was hight positive because of productivity and quality specially tomato hybrid varieties such as Ramya, Rakshita, Manisha. Many improved open pollinated varieties suitable for commercial production in project areas were also liked by the farmers such as in Tomato - Gresco; in Cucumber - Bhaktapur Local; in Radish-40 days and All Season; and Brinjal-Noorki. The name of crops and the popularized hybrid and improved varieties used are presented in Annexes-2.1-2.6.

ii. Fruit Crops

Eleven OFDs on fruit crops were conducted successfully which are described below:

Papaya (Mathuri and Madhubala) - Papaya varieties have been introduced in Terai districts as well as in Palpa and Syangja, more number of male plants in some area created a problem. Farmers found problem to dispose even though good production in Nawalparasi district.

Banana (William Hybrid) - This variety of banana introduced for demonstration in Rupandehi and Kapilbastu districts; propagated through plant tissue culture technique from Kathmandu, plant-lets raised in nursery for about 3 months transplanted in field.

Citrus - Management demonstration on citrus has been conducted in citrus (mandarin) crops in Bharatpokhari of Kaski district. Practical training on Bordeux paste application, micro-nutrient spray as well as manuring and fertilizer application were part of demonstration. Farmers have adopted these orchard management demonstration packages in the production pocket and benefited economically with increased production and better because of better quality juicy fruits.

iii. Livestock

Thirty-eight OFDs – 7 in 9 in poultry and 22 in on forage grass-were conducted. The results were encouraging with increased diffusion and adoption in the project-area. Seventeen on-site trainings – 7 in pig and 10 in poultry were conducted. There pig resource centers were established to supply piglets to farmers. Small scale commerce poverty with 100-500 binds was promoted. However, livestock activities was dropped in January 2000 as recommended by Mid-Term Evaluation Team to focus on HVC-vegetables and fruits for better utilization of the project resources.

B2a2. Improved Agricultural Extension Services

MARD interventions centered on helping farmers use improved technologies on off-season HVCs for improving productivity dramatically and thereby have large volume of products to sale based on market-demand enabling them to increase their income. On-farm demonstration was the key activity to help farmers believe in these technologies. Other key extension tools used for rapid adoption and diffusion of HVC technologies included training, tours/visits, farmer field day, meeting and workshops etc. besides many others. Some of the key extension tools intervened during the project period are summarized below.

i. TA Intervention Sites

Initially, TA intervention activities were conducted in 72 sites and by the end of the project reached to 123 sites.

ii. Farmer Groups Formation and Preparation of Profile

Farmer groups operating in 6 districts of Lumbini-Gandaki zone by year during four fiscal years are presented in Table-14. MARD TA Team started working with 82 farmer groups involving 1584 farm families with 29% female participation during FY 1998/99. Farmer groups gradually expanded/increased along with site expansion and in the 5th project year (FY 2001/2002), MARD TA Team has been operating through 163 farmer groups involving 2767 farm families with 31.7% female participation. Farmer groups increased by 99% and farm family members increased by 75% during the project period in Lumbini-Gandaki zone. Table shows that these 163 farmer groups have already generated more than 3 million rupees as welfare fund (group fund). Farmer groups' profiles were prepared and updated.

iii. Training

Major focus has been on On-Site Training (OST) in the farmers field in the production pockets. District coordinators, motivators and concerned specialists were responsible for conducting such trainings. In addition, many specialized trainings were conducted during the project period to fulfill specific training needs. These trainings were conducted at field, district and project level depending on the type of training.

<u>On-site training</u>

A summary of OST conducted during the project period in Lumbini-Gandaki is presented in Annex-2. OSTs were mainly focused on tomato, potato, cauliflower, cabbage and cucumber etc. However many trainings in other HVCs such as egg plants, gourds, French beans, squash etc. were conducted based on the training needs identified by the farmer groups during the bottom-up planning workshops conducted every year. Annex-2 shows that out of the 534 OSTs planned during the four project years 554 OSTs have already been conducted to more than 11,656 participants. These trainings conducted in the farmer's field were noticed to be more effective and practical in transferring knowledge and skill to the farmers as compared to class room trainings.

In addition, based on the needs identified in bottom-up planning workshops, trainings on Integrated Pest Management (20 trainings), Micro-nutrients (26 trainings), Seed Production

(1 training), Soil Management (6 trainings) and Post-harvest Handling (4 trainings) were conducted by DCs, Specialists and STC.

Specialized Trainings

Eleven different types of specialized trainings were conducted to fulfil specific training needs of farmers, LAs and TA team members in Lumbini-Gandaki are given in Annex 1. This included three trainings for motivators, PRA/RRA, and Group Dynamics and Gender Sensitization Trainings to TA Team members for making them more effective and productive in carrying out field activities. Similarly, training on Papaya cultivation in Kapilvastu, Rupandehi and ginger cultivation in Palpa and Syangja were conducted for potential papaya and ginger growers, respectively. Nine trainings on Integrated Pest Management to 209 farmers in 6 districts were conducted to enhance the use of IPM techniques at the same time minimizing the use of dangerous insecticides/pesticides. One communication skill training on farmers group strengthening and marketing was conducted for 27 participants involving LA and TA staff to enable them be more effective in working with farmer groups.

Training on technology upgrading to agro-input suppliers/agro-vets was conducted twice for 63 agro-vets in order to help them by technical back-stopping.

Table 14: Summary of Farmer Groups Operating in the Project Area by Year

S. N.	District	FY 1998/99		FY 1999/2000		FY 2000/2001		FY 2001/2002		
		# of group	Mem-bers	# of group	Mem-bers	# of group	Mem-bers	# of group	Mem-bers	Group fund (NRs)
1	Kaski	14	242	15	261	19	313	29	538	239,906
2	Syangja	14	293	17	325	18	338	24	410	1,813,397
3	Palpa	14	235	16	272	17	282	23	364	461,076
4	Nawalparasi	14	319	14	322	19	421	26	507	310,229
5	Rupandehi	13	253	16	311	17	340	29	461	184,265
6	Kapilvastu	13	242	13	253	17	336	32	487	236,709
	Grand Total	**82**	**1584**	**91**	**1744**	**107**	**2030**	**163**	**2767**	**32,48,582**
	Male		**1119**		**1258**		**1504**		**1917**	
	Female		**465**		**486**		**526**		**850**	
	% Female		**29**		**28**		**26**		**30.7**	

Farmers Field Day

OFD followed by production program was the main focus to help farmers improve the productivity of HVCs. Farmers Field Days (FFD) were organized to help in rapid diffusion and replication of HVCs technologies within and outside the MARD pockets. Eighty-six farmers field days conducted for 3458 farmers during the project period in Lumbini-Gandaki.

Observation Tours

Study/observation tours conducted for farmers and Line Agencies in the Lumbini are gien in detail in Annex 1. Farmers tours conducted included one tour from three hill districts to three terai districts for 58 participants in FY 1998/1999. Similarly, in the same fiscal year three tours (Nawalparasi to Kapilvastu, Rupandehi to Kapilvastu and Kapilvastu to Nawalparasi) were conducted for 50 farmers. During FY 2000/2001, 37 farmers observed production and

marketing activities in Bara, Sarlahi and Dhanusha districts. Six observation tours (one for each district) conducted in FY 2001/2002 for 87 farmers.

Altogether 9 tours were conducted in FY 2001/02 involving 320 farmers and LA staff. Main objective of these tours was to observe and learn the improved production and marketing technologies/techniques and practices and adopt them as they see fit to their own situations.

Group Mobilization

Group approach has been main vehicle for the TA Team to work with and reach out many more farmers for rapid adoption and diffusion. Thirty-one group mobilization conducted for 784 members of the farmer groups. Major activities for mobilizing and strengthening the groups included:

- Group formation
- Group mobilization training
- Group meeting
- Generation of welfare fund
- Utilization of welfare fund
- Conflict management
- Group seed/input buying
- Group marketing of products
- Record keeping
- Group competition
- Group profile preparation and updating
- Intensive follow-up of the group

Short Term Consultancy

Study on IPM and Hybrid Technology upgrading was completed. The findings were shared with project area farmers, traders and LA staff.

B2a3. Improved Nutrition

i. Nutrition Demonstration Household

Forty-eight nutrition demonstration households selected and established during the four years of project period in Gandaki-Lumbini. The NDHs played an important role in the diffusion of nutrition package.

ii. Kitchen Garden Demonstration

Based on the list of targeted vitamin A-rich foods, a kitchen garden plan was prepared for demonstrating how the relevant vegetables and fruits can be grown on a small plot near the NDH, without detracting from other on-going income-producing livestock, poultry and crops. New kitchen garden demonstrations organized were 1622 by the end of the project. The field staff had follow-up to provide technical assistance to the new kitchen garden owners.

iii. Rural Household Poultry Demonstration

Earlier MARD analysis of the nutritional impact of poultry of household diets was used to develop a poultry demonstration model for NDH's where poultry is culturally acceptable. The model was coordinated with the MARD Livestock Specialist. The poultry activities were stopped in 2000/01 as there was no support facilities for immunization/vaccination program at the village level. Vaccination/immunization program was available only for commercial poultry entrepreneurs.

iv. Nutrition Training: The following several trainings conducted enhanced skills and diffused improved nutrition program.

Conducted 127 nutrition education trainings to 3657 participants (mostly women) during 1998/99 and 2000/01.

Three-hundred skill development trainings were conducted: 201 on kitchen garden for 4132 participants, 79 on Vitamin A food promotion/demonstration and hygiene & sanitation for 1752 participants, and 20 on food preservation and storage for 478 participants (88% women). As a result of kitchen garden training 1622 households adopted improved kitchen garden in the project pockets.

Training of trainers (TOT) were completed in kitchen garden and hygiene and sanitation.

Public awareness/NCAP trainings were conducted 77 times for 1165 participants.

Provided specialized project level training on public awareness/NCAP to 6 MARD District Coordinators and 1 Junior Technical Officer.

Nutrition awareness training for influential group (VDC/school/local institutions/agro-vet)/NCAP conducted 5 times for 136 participants (66% women).

v. Nutrition Field Day

Nutrition field days were organized 25 times for 778 participants (about 79% women) which helped to adopt and diffuse improved nutrition program.

vi. Tour/Observation

A nutrition observation tour to Nawalparasi, Kathmandu and Bhaktapur was organized for 36 participants (5 women NDHs each from 6 MARD districts and 6 women Motivators). The visits made to different places very helpful to raise awareness of project area farmers, as the visit experiences were shared in the group meetings.

vii. Survey of Nutrition Practices

Throughout July and August, 2001, a Nutrition Practice survey was conducted in MARD and non-MARD households located in Rupandehi and Kapilbastu districts, to access the impact of the MARD approach. A total of 430 MARD households and 389 non-MARD households were interviewed. The survey found that the MARD trainings has contributed to effectively increase the nutrition status of the pocket area households.

viii. Nutrition Household Survey

The MARD Team applied the KAP model to design and implement its interventions to reduce night blindness. In order to understand the levels of nutrition knowledge and practices relevant to night blindness, a benchmark survey was conducted with 10 pregnant or lactating women in each MARD/Lumbini-Gandaki VDC. It was followed in annual performance monitoring surveys by M&E unit and found positive impact of the nutrition program.

ix. Nutrition Workshop

The food-based nutrition strategy workshop was held at Regional Training Center, Manglapur, Rupandehi on March 26th and 27th, 1999. The major outcome of food-based nutrition strategy workshop was MARD/Lumbini-Gandaki Nutrition Action Plan which had three parts:

- Nutrition demonstration program package is implemented through each project NDH to reduce night blindness that consists of 7 components.
- Extension training and dissemination of nutrition technology through nutrition demonstration household.
- Ethical protocol for dealing with project beneficiaries that are found to be at critical risk from malnutrition/or disease during the course of implementing program intervention is introduced and disseminated through nutrition demonstration household.

A post-harvest technology workshop was jointly organized for commercial and household level in Sept. 6-7, 1999 at ADB/N, Mangalapur.

x. Nutrition Fact Sheets

Three-thousand sets of 40 Fact Sheets on Food-based Nutrition were developed, printed and distributed to different organizations and to influential groups. The major topics covered under "Vit. A is essential for human health" are Vitamin A saves lives, Sources of Vitamin A from plants, Recommended recipes, Preservation & storage of food.

xi. Short Term Consultancies

Output from STC

- Kitchen garden manual
- Household poultry manual
- Vitamin A-rich food promotion/demonstration manual
- Household food preservation and storage manual
- Hygiene and sanitation manual
- Communication Strategy for MARD Nutrition Program
- Revised Communication Strategy for MARD Nutrition Program Report

Xii Summary of major nutrition activities in Rapti and Lumbini-Gandaki completed are shown in Annex-3

B2a4. Bottom-up Planning, Co-ordination and Policy Issue

i. VDC Level Bottom-up Planning

Bottom-up Planning (BUP) through participatory approach has been entry point for MARD interventions. Bottom-up planning exercises are the key to identify farmer's problems/needs and priorities for planning developmental activities. This means making decisions as close to the point of impact as possible. This also employs making the development agencies annual plan responsive to the priorities and needs of the target groups.

Altogether 96 BUP workshops were conducted during the project period involving more than 3,300 participants.

Outcomes of the final BUP workshops involving 150 farmer groups are summarized in Table 15 and Table 16. At group level about 1000 hectares were planned to produce about 21000 Mt HVCs selling more than 16000 Mt products worth about Rs. 18 millions (Table 15). Based on the sale values, top five prioritized HVCs by district are presented in Table 16. Out of the prioritized HVCs tomato ranked number one in all 6 districts. Potato, cauliflower, cabbage and cucumber ranked in top five HVCs in most of the districts. In addition, citrus in Kaski, Chilli and radish in Palpa, eggplant and pea in Rupandehi, and onion and bitter gourd in Kapilvastu ranked in top five HVCs. Other details are provided in Annex-4.

Table 15: Summary of Area, Production, Sale Volume, and Sale Value Planned During BUP Workshops for FY 2001/2002*

S.N.	District	HVCs			
		Area (ha)	Estimated Production (mt)	Estimated Sale volume (mt)	Estimated Sale value (Rs. '000)
1	Kaski	132	2100	1717	19998
2	Syangja	60	1725	1248	14868
3	Palpa	114	2317	2046	15215
4	Nawalparasi	176	3452	2798	15056
5	Rupandehi	191	4936	3676	21850
6	Kapilvastu	279	6441	4864	30603
	Total	952	20971	16349	117590

* Includes the plan of 150 farmer groups only not the whole MARD pockets.

Table 16: Summary of Prioritized HVCs by District During BUP Workshops for FY 2001/2002

S.N.	Crops	Kaski	Syangja	Palpa	Nawalparasi	Rupandehi	Kapilvastu
1	Potato	IV	V	II	II		
2	Tomato	I	I	I	I	I	I
3	Cauliflower	V	III	III	III	II	II
4	Cabbage		IV		IV	III	V
5	Cucumber	III	II		V		
6	Chilli			V			
7	Radish			IV			
8	Eggplant					IV	
9	Pea					V	
10	Onion						III
11	Bitter gourd						IV
12	Citrus	II					

ii. Coordination

MARD/PCO at Tulsipur, Dang also having Liaison Office at Butwal has facilitated the overall coordinating role of MARD activities by LAs and TAs. Budget support to LAs in Rapti was provided by the USAID/N from FY 1996/1997 through FY 1999/2000. After relocation of MARD/Chemonics TA Team in Lumbini-Gandaki from September 1, 1998; the budgetary support to LAs in 6 districts of Lumbini-Gandaki zone was provided by USA during FY 2000/2001 and FY 2001/2002. Four persons deployed as MARD Project Coordinator during project's 5 year period, most of them part timer, thus having only limited time for coordinating project activities. However, the level of coordination improved significantly in the fourth and the fifth project year.

District Level

In respect of establishing and strengthening linkages between TAs and LAs, MARD/Chemonics attempted to coordinate with LAs at field/district level and also at project level. Key activities to establish better working relations at both the levels are listed in Table 14. At district level, major activities included joint efforts in monthly meeting, progress reporting, program planning and field monitoring. Participation of LA staff in TA organized trainings, tours, meetings, and workshops were the major areas of coordination between LA and TA. Use of SMS from LAs as resource persons in TA organized trainings with minimum remuneration was also very effective in coordination.

District level project wrap-up closing workshop was organized in co-ordination with District Agriculture Development Office in each district during the 4th week of January 2002. Altogether more than 390 persons representing from farmer groups, marketing groups, NDHs, Agro-vets, traders, VDCs/NPs, District Development Committee, District Administration Office and IDE had participated in the closing workshops.

Project Level

Major areas of coordination at project level included jointly organized Annual Progress Review and Implementation Workshop, Annual Program Planning and Budgeting Workshop, Marketing Workshops and Start-up Workshops. Steering Committee Meeting, MACC Meeting and Bimonthly/Quarterly Meeting were very effective forum for improving working relations amongst farmers, LAs, and TA team. Field visits by HMG and USAID officials were very useful in further strengthening effective program implementation besides many other areas of coordination listed in Table 17.

Training/Orientation

Orientation on Market development program, crop enterprise budget estimation, monitoring and evaluation process and group/site/VDC profile preparation was provided to LAs staff in 2000/01.

Two project level trainings on computer applications, one for LA and another combined for LA and TA, were conducted at Butwal to help improve computer skills of LA an TA staff.

Before end of the project, a MARD/Chemonics Project Closing Workshop was organized at Hotel Himalaya, Kupandole, Laliptur on February 12, 2002. Papers on the overall achievements of the MARD/Chemonics Project were presented in the workshop and experiences of the project beneficiary groups and LAs were also shared. More than 95 representatives from USAID/N, MOA&C, DOA, MDD, Regional Agriculture Office, Pokhara, MARD PCO, DADOs, farmer groups, marketing groups, NDHs, Agro-vets, traders, VDCs/NPs, partner agencies and all TA staff had participated in the closing workshop.

Mobilization of OJTs

As in Rapti, MARD/Chemonics TA team has two batches of On the Job Trainees (OJT) as interns for 5 months period from Technical School, Uttarpani in Lumbini-Gandaki zone. One batch of 10 OJTs comprised of 8 female and 2 male during FY 1999/2000 and second batch of 10 OJTs comprised of 7 female and 3 male during FY 2000/2001. These OJTs were deployed in 6 MARD pockets/districts to have practical training under the supervision of DCs and coordinated by SES. These OJTs were very useful as helping hands in carrying out MARD activities in HVC production, marketing and nutrition along with participatory bottom-up planning exercises. They were evaluated and sent back to the Technical School, Utterpani, Dhankutta after completion of their 5 months practical training in the field.

Table 17: Summary of Key Activities for Coordination and Linkages

District Level Activities	Project Level Activities
• Monthly Meeting of DC with LA • Monthly Progress Reporting • Joint Program Planning • Technology Exchange • Joint Field Monitoring • MIS Support/Exchange • Formal/Informal Interaction/visits with LAs • Participation of LA staff in BUP workshops • Jointly organized District Level Workshops • SMS of LA used as Resource Person in TA organized training • LA tour in MARD pockets • Participation of LA in communication skill training and a few others • Computer application training for LA (2 times) • Participation in district field visits, bimonthly/quarterly meeting and workshops • Participation in observation tours by LA in Nepal and India	• Annual progress review and implementation workshop • Annual program planning and budgeting workshop • Marketing workshops • Start-up workshops (twice in Rapti on May 3, 1997 and another on November 9, 1998 at Butwal • Steering committee meeting • MAAC meeting • Participation of LA and TA in bimonthly/quarterly meetings (3 in Lumbini-Gandaki - one at Lumle, second at Pokhara and third at Manglapur) • MARD Lumbini-Gandaki Coordination Working Session (March 8-9, 2000 at Pokhara) • MDP workshop • Orientation to LA staff on crop, enterprise budget estimation, monitoring and evaluation, and preparation of site and group profiles • Price broadcasting by Radio Nepal in Coordination with RD. • Participation of TA team in workshops organized by RD and MARD/PCO • HMG high official visits in MARD pockets • Visits by USAID, IDE, Chemonics head office, and other I/NGOs in MARD pockets • Visits by performance review team

iii. Policy Issues

Major policy constrains identified were in the among, octrai taxation, lack of consumer protection, regulations of seed, fertilizer, and pesticide quality, and lack of sustainable marketing institutions for agricultural inputs and high-value commodities. During BUP workshops also availability of quality seeds was identified as major constraint limiting productivity.

Major contribution of the project in policy issues could be summarized as follows:

- DAI cross-boarder study team visited Rapti area during May 7-13, 1998 and was assisted by the MARD TA team throughout their visit in Rapti and India. The purpose of the study was to support MARD project by examining agricultural marketing system, policy and operational effects along the marketing chain and analyze the constraints and problems that already affect marketing operations for horticultural products in the Rapti zone.
- Relaxation on octrai taxation through dialogues with Mayors, DDC, DSP, CDO and other concerned authorities.
- Training to 106 potential agro-vets (25 in Rapti and 81 in Lumbini-Gandaki) in order to ensure better supply of quality seeds/agro-inputs in the MARD pockets.
- Publication and distribution of Seed directory (MARD/Lumbini-Gandaki Technical Report No. 32 and Technical report No. 61.
- Help in allocation of space for market stalls at Butwal Haat bazaar to Marketing Groups of Madanpokhara, Palpa, Khudabagar and Dayanagar of Rupandehi Districts; market stall at Taulihawa Haat Bazaar for Marketing Group of Kapilvastu Municipalities.
- Two policy studies conducted on Accelerating Technical Change in Agriculture (Technical Report No. 40) and Lowering the Cost of High-Value Agricultural Commodities (Technical Report No. 41).
- To minimize the use of dangerous insecticides/pesticides especially in vegetables, Integrated Pest Management techniques were intervened for extensive use in vegetable farming.
- The use of BUP workshops at group/VDC level to identify and prioritize the local needs in the MARD pockets has been very useful to identify policy issues to be addressed by local, district, regional and central level policy makers.

Publications/Reports

MARD TA team attempted to document key interventions and their results along with publishing many training/extension materials. The number of publications as of March, 2002 totaled 250. Altogether 231 reports comprising of 23 performance, 112 technical, 42 training/tour, 42 workshops and 12 manuals were published. Total list of publication by the MARD TA team is given in Table 18 and detailed list in Annex-5.

Table 18: MARD Publications/Reports by Types/Categories and Year

S. N.	Types/Categories	Fiscal Year					Total
		1997/98	1998/99	1999/00	2000/01	2001/02	
1	Performance Reports (Blue)	5	5	5	5	4	24
2	Technical Reports (Pink)	19	36	29	19	29	129
3	Training/Tour Reports (Green)	10	7	15	9	2	43
4	Workshop Reports (Yellow)	20	10	6	6	-	42
5	Manual/Bulletin (White)	2	1	4	2	3	12
Grand Total		56	59	59	41	16	25

B5. MONITORING AND EVALUATION

B5a. Activities Implemented

B5a1. Benchmark Surveys

Benchmark data were collected in two phases in Gandaki-Lumbini project pockets. In phase 1, during July 12 - August 11, 1998, the TA team conducted a rapid reconnaissance assessment of the districts to confirm the feasibility of continuing the MARD/Rapti program in these districts and their respective VDC pockets. In phase 2, during October 12-30, 1998, the TA Team used participatory rural assessment (PRA) methods in village level surveys to estimate the scope and level of rural development activity during HMG fiscal year 1997/98 (MARD Lumbini-Gandaki technical report no. 26). The performance indicators were chosen to support USAID/Nepal's economic growth program objectives under the MARD/Chemonics contract. These data used to set MARD/Lumbini-Gandaki performance targets for the second project year (1998/99), as well as serve as a foundation for bottom-up planning and policy dialogues that the Team and HMG line agency staff would conduct in project villages throughout the project year.

At the request of USAID, 1997/1998 performance benchmark data were estimated for all non-project areas of the 6 pockets.

B5a2. Annual Performance Monitoring Surveys

Performance monitoring data were collected for fiscal years 1988/99, 1999/2000, 2000/01 and 2001/2002. The survey in these 4 years applied the same format and methodology as in the 1997/98 benchmark survey, except that priority high value-value crops (PCCT: potato, cauliflower, cabbage and tomato) were summarized as a group, pumpkin was added as a high crop, and ground forage was added under livestock. The data collection on livestock was stopped since FY 2000/01 because the livestock activities were dropped in January 2000 as recommended by the project mid-term evaluation team. The results obtained on high value production and marketing as well as performance indicators over last 4 years have shown positive changes (Tables-19; 25).

Similarly, performance monitoring survey for non-pockets were conducted for FY 1998/99 but for 1999/2000 and onward the survey couldn't be continued due to security reason. However, there was positive change even in one year in non-pockets (Lumbini-Gandaki technical report no. 47). Comparison of crop production estimates, bench-mark versus non-project areas in MARD Project Pockets is presented in Table-26

B5a3. Training

Every year, training on M&E performance data collection methods was provided to the Enumerators (mostly hired from New Era) to collect the data accurately. In 4 years of project period, 70 enumerators (few TA field staff) were trained. M&E survey orientation to LAs staff was provided in June 2001 which helped the participants familiarize about the MARD M&E system.

B5a4. Pocket Level Map

Pocket level maps were prepared and published in July 1999 and later on, added sites were updated to facilitate the TA Team and other concerned parties.

B5a5. Progress Reporting

Computerized data base used to monitor and generate information for the quarterly and annual performance monitoring reports. It was also used to up-date indicators, as well as track progress of the project activities that promote changes in the indicators.

The tracking of project intervention activities helped in using project resources efficiently. All the quarterly reports (16) were prepared in time and submitted to the concerned parties. Annual progress of the project activities were incorporated in the 4 annual work plans. The performance monitoring data reports were translated into Nepali and a copy sent to each concerned VDC/NP office. Transportation of data collected and compiled was maintained by sharing with the VDC staff.

Summary of tracked major project activities completed during the project period are presented Tables-19, and in Annexes 1, 2, 3 and 4.

B5a6. Field Monitoring of the Project Activities

Like in Rapti, beside monitoring and evaluating the project activities through annual PRA survey, project's field activities were also monitored and evaluated thorough frequent field visit, interaction with TA Team staff, LAs staff and project beneficiaries. It helped the project management to implement the intervention activities in a planned way.

Table 19: Summary of Four Project Components' Major Activities Completed, MARD, April, 1997 - February , 2002

Table : Summary of Four Project Components' Major Activities Completed, MARD, April 1, 1997 - February 11,

S. N.	Activity	Unit	Market Development						Technology & High Value Agricultural Extension Services						Nutrition Improvement					
			1997/98	1998/99	1999/00	2000/01	2001/02	Total	1997/98	1998/99	1999/00	2000/01	2001/02	Total	1997/98	1998/99	1999/00	2000/01	2001/02	Total
1	Workshops	No.	4		1	5*+1	1*	6+6*=12				5*	1*	6*		1	1	5*	1*	6*+2
	Participants	No.	323		80	324*+58	59*	461+383*				324*	59*	383*		56	83	324*	59*	139+383*
2	Demonstration Sites:																			
	In Rapti	No.							189					189						
	In Gandaki-Lumbini	No.								72**	72**+24=96	96**+6=102	102**+21=123	123**						
3	HVP Demonstrations (crop)/NDHs	No.							406	438	477	127	42	1490	24	12	12	12		48
4	Trainings	No.	11	22	20	26	3	82	92	93	112	159	205	661	33	47	93	115	181	469
	Participants	No.	256	527	504	514	90	1891	1488	2310	2589	3149	3937	13473	818	1222	2521	2765	3731	11057
5	Linkage Visits	No.	5	3	6	36	11	61	4	4	6		6	20				1		1
	Participants	No.	104	20	78	387	107	696	88	108	37		87	320				36		36
6	S-T Consultancies	No.	1	2	3			6	3		1	1		5	2	5	4	2	1	14
7	Field Days	No.								27	25	32	2	86			12	13		25
	Participants	No.								1121	1147	1118	72	3458			362	416		778
8	Market Info. Systems (price information board)	No.	2	6	5	1		14												
9	Regional Market Price Radio Broadcast	Times			5/week	5/week		5/week												
10	Agro-vet Mobilization	No.								36	45	56	72	72						
11	Policy Studies	No.																		
12	Bottom-up Planning	No.																		
	Participants	No.																		

* integrated workshops in the 6 project district pockets ** new sites developed and operated *** without repeating integrated workshops

Note: Beside crop demonstration as mentioned above, demonstrations on livestock activities were also conducted in 19998/99 and 1999/2000 respectively 14 and 22. Pesticide re
were conducted for 166 participants jointly by MS & SES which is reported in both components.

B5a7. Secondary/Field Data/Information Collection and Processing

In-order to facilitate the TA Team and the concerned parties in implementing project intervention activities, project's relevant secondary, field data, information were collected and processed, and provided to them as and when needed. Monthly and quarterly progress reporting formats for Motivators and DCs were developed and revised when necessary. Various information were utilized addressing agricultural policy issues also.

Completed documentation of important project information as needed. Precautions were taken against computer virus and maintained regular backup of important electronic data from accidental loss or damage.

B5a8. Short Term Consultancies

Completed a technology diffusion assessment study in September 2001. The report has shown positive impact of the project in technology diffusion aspect (Lumbini-Gandaki technical report no. 98 by STC Mr. Tek Bahadur Shrestha).

B5a9. Publication

The M&E unit of the TA Team involved in the preparation (directly/indirectly) of publication as follows:

	No.
Annual work plan	4
Quarterly performance reports	15
Performance benchmark	2
Annual performance monitoring:	
in English	5
in Nepali	5
Diffusion of innovation	1
Maps	2
Consultancy	4
Project completion report (M&E)	1
Project completion report of	

B5b. Performance Indicator Target Results

The project was managed by performance objective. The performance indicators targets were established on June 1999 and modified on August 2000. The Annual work plover describe the work activities that were planned and implemented successfully in the respective component as were described in respective section in this report. The work activities were designed to impact the performance plan output indicators for each component which resulted in achieving or exceeding all the performance indicators targets set during and project periods in Gandaki-Lumbini as summarized in major accomplishment of this report (section V).

SECTION IV – ISSUES AND CONSTRAINTS EXPERIENCED

The disturbing political environment in the Rapti Project area hampered the smooth and effective implementation of the Project activities to some extent.

A1. Market Development (Rapti & Gandaki-Lumbini)

- **Lack of fund for hardware activities:** The fact that MARD/TA does not have construction/hardware provision/fund made it unable to provide, free of charge materials like plastic crates, weighing machines, mini-trucks/vehicles to the farmers nor could it construct heavy structure for market shades or rural roads to link market, which many farmers and Line Agencies staff often thought as compulsory component for long term market development This thing seemed to have often created some sorts of disenchantment among the partners/farmers in carrying out market development programs. Actually the Project did not believe this type of concept/approach which focused on such free distribution of materials will help develop sustainable market development after the departure of the Project. Such attitude of farmers and line agencies often overshadowed the benefits and achievements of the non-hardware sustainable approach of the Project.

- **Lack of farmers marketing institutions/feeling of group approach among the farmers:** Although in paper there were hundreds of farmers production groups in the Project area actually there were very few functional farmers groups. Marketing groups were virtually non-existent before the commencement of MARD. Lack of marketing groups, almost absence of group feeling among the farmers demanded intensive efforts of the MARD staff to implement market development activities.

- **Lack of adequate markets/collection centers:** There were very few periodic local market like Kapurkot in the Project inner area. There was lack of hatbazar type markets which could be used as collection center as well as shipping out center for the locally produced surplus vegetables.

- **Lack of marketing information:** There was lack of information like price trend, traders/wholesalers number/contact address in major and local markets, demand and supply information of major markets etc. Thus, under such situation MARD TA had to develop all most all aspects of Marketing System to meet Project objectives.

- **Inadequate full-time market extension staff:** MARD TA Team had one full time Marketing Specialist and one Market Officer till July 2000, and the marketing support activities in the project area were facilitated and implemented by District Coordinators and Motivators working with farmer groups and marketing groups. However, no such field level facilitators and implementers for market development programs are identified and assigned incase of district agriculture development office (DADO).

A2. Technology and Improved Agricultural Extension Services

- Lack of technical know-how on vegetable cultivation among the farmers of MARD project areas especially on:

  - high value vegetable crops;
  - importance of commercial vegetable cultivation;
  - technical know-how on off-season, early or late season vegetable production;
  - little knowledge about the use of improve or hybrid varieties of vegetables;
  - limited knowledge about season of growing;
  - lack of information about diseases and pests responsible for crop production and their control;
  - limited knowledge about health hazard of insecticide and fungicides;
  - lack of knowledge about the use of balanced nutrients to maintain the soil fertility, overdose use of nutrients, etc.;
  - lack of knowledge about the importance of pH maintenance by lime application;
  - no knowledge about useful and harmful insects for plant protection purposes;
  - knowledge on IPM (Integrated Pest Management) is almost nil;
  - no knowledge about different micro-nutrients causing decline of production specially zinc, boron, iron, manganese, molybdenum, etc;
  - limited use of compost responsible for poor yield; and
  - limited knowledge about nursery technique for seedling production

- Limited numbers of Agri-input centers in production sites:

  - lack of improve and hybrid seeds, appropriate variety;
  - lack of seeds on time;
  - lack of quality seed; assured supply of seeds;
  - limited quantity as per demand;
  - no appropriate plant protection chemicals available;
  - most of the chemicals are costly;
  - sprayers and dusters are costly; and
  - IPM tools are not available.

- Limited production of vegetables specially during winter and summer:

  - farmers have to depend upon rain water;
  - limited knowledge about water management, sometimes over-irrigation cause setback to crop growth;
  - no timely irrigation; and
  - irrigation materials such as pipe, sprinkles not available easily and costly

- Lack of knowledge about vegetable marketing:

  - no knowledge about market-led production, i.e. no demand-led production, vegetable type;
  - limited volume of production for market;
  - no information about seasonal demand;
  - no knowledge about distant market;

- no information about price;
- limited knowledge about post-harvest handling such as grading, packing, storing, transportation; and
- lack of group or cooperative marketing.

- Lack of financial support at village level:

  - lack of money to buy agri-inputs; and
  - lack of knowledge about saving and credit i.e. group fund.

- Lack of marketing centers:

  - lack of collection centers;
  - lack of market for vegetable;
  - no storage facilities for perishable vegetables; and
  - no contact with vegetable traders and wholesalers.

A3. Improved Nutrition

- Nutrition program intervention could teach people beneficial facts as to develop necessary skills, motivate them to make behavior change but can not solve the problems of lack of food, lack of income, lack of land resources and all the issues related to nutrition.
- There is limited knowledge about the importance of sound nutrition and production options that are required to allocate balanced nutritional food preparation. The demand to improve nutritional status has to come from household. This is further aggravated by current nutrition policy which has promoted nutritious food as a "luxury" in the eyes of rural poor rather than a necessity for improving the quality of life.
- Lack of coordination of nutrition and agricultural production interventions. There is no corroborative efforts to increase production and consumption of key nutritious food, ameliorate food scarcity by food preservation and storage and increase income.
- There exists conflict between dual goals of increasing production and marketing of high value crops and improving nutritional status. Firstly, conflict on the part of produces about whether to sell or consume the high value food products and secondly, conflict about whether the selection of crops should be based on marketability and cash value rather than nutrition content.
- Because of budgetary limitation MARD food-based nutrition communication campaigning plan could be partially launched and followed up. The campaign included mobilizing community influential groups, agro-vets and local and regional media representative to disseminate messages on importance of vitamin A and what families should do to improve their diets. Due to resource limitation and short duration of the nutrition program sustainability of MARD nutrition program may require further support.
- Lastly, bringing changes in dietary practices/behavior is a complex process. The effects of nutritional deficiencies are delayed so the nutrition interventions are not perceived by the community as urgent and therefore community is less motivated to comply.

A4. Bottom-up Planning, Co-ordination and Policy Issue

Bottom-up planning at VDC-level is non-existent in the LA. Although LA is responsible for developing program activities for the whole district, their program activities are limited in nature because of inadequate resource budget to build collection centers and irrigation canals, which were demanded by the Live Agencies and some farmers created misunderstanding about the project's role. Inadequate allowances to LAs staff some times made misunderstanding while implementing the project activities. LAs' staff, most of the time, asked about the provision for human resource development, which was not sufficient in the project to meet their needs, and were outside the scope of TA Team.

A5. Monitoring and Evaluation

While this project has performance targets for agricultural production, marketing, farmer organizations, agro-enterprises, and nutritional status, it is not possible to simply report HMG statistics as the verification of these targets. First, published HMG agricultural production information is available only 6 or more months after the end of the project work plan year (HMG fiscal year), and would therefore be too late for inclusion in annual project reports. Second, there are no district level HMG secondary data series available to describe trends in agricultural marketing (prices and volumes), numbers of traders and micro-enterprises, and nutritional status. Finally, the raw HMG agricultural production data reported at the end of each fiscal year are not based on representative sampling methods, nor are the data available below the district level. These limitations require the TA Team to use a combination of rapid reconnaissance survey techniques to produce timely estimates of project performance indicators that are reasonably valid measures of actual changes in rural development conditions in project production pockets.

The project monitoring system was implemented as an investment for demonstrating its long term usefulness in enhancing the line agencies' data collection systems. While the untimely withdrawal of the project from Rapti has meant that even the demonstration effects of project monitoring efforts on line agency monitoring programs has been lost. In Gandaki-Lumbini, it took time to establish good co-ordination with District LAs. However, orientation on MARD M&E system was provided to LAs. Performance monitoring in Non-pockets couldn't be continued from 3rd project year due to security reason.

Lack of budget near to the end of project caused scaling down in implementing some project activities. However, all the performance indicator targets were accomplished or exceeded.

SECTION V – MAJOR ACCOMPLISHMENTS

The impact made in the project pockets is due to collaborative efforts among TA Team members, Line Agencies staff, and beneficiary groups and support from concerned agencies/local institutions.

A. Rapti

A1. Market Development

- Established haat bazaar at Bijuar, Pyuthan and Tulsipur, Dang which helped farmers to sale their high value products.
- A market information system was established and strengthened for monitoring sales of high-value commodities and describing market trends and opportunities to farmers and commodity traders.
- Market linkages between traders and commission agents in Rapti and India were identified and strengthened through the establishment of traders network at Butwal.
- Contract production of vegetable seeds was promoted through marketing management workshops. 86 mt of vegetable seeds mostly radish seeds was contracted for purchase between traders and seed producer farmer groups of Salyan, Rukum and Rolpa. Advance booking made with producers for 112 mt. of vegetable seeds for 1998-1999 season.
- Commercial farmers, Agro-entrepreneurs, leader farmers, LAs' staff were benefited by the marketing management training provided.

A2. Improved Extension and HV Agricultural Extension Services

- Over 400 OFDs conducted greatly helped the farmers to select and expand high yielding crop varieties. OFDs result was encouraging.
- Papaya production block established at Urahai VDC, Dang for production and marketing by the farmer groups.
- One feed mill established for poultry in the private sector in the Tulsipur pocket.
- Giriraja breed of poultry promoted in rural areas.
- Two pig resource centers established helped to promote pig raising.
- Farmers surrounding the crop demonstration sites were provided intensive production support services on varietal selection, cultivation practices, market timing, and integrated pest management (IPM) practices.
- Farmer organizations surrounding the crop demonstration sites were strengthened through training of farmer-trainers and group consultations on production and marketing management.

A3. Improved Nutrition

- New nutrition package was developed. Key messages and behavior changes were included for each nutrition topic. The messages were disseminated during nutrition awareness training.
- The knowledge attitude practice (KAP) social marketing approach was used to line a food based nutrition strategy with practical measures of nutritional program performance.
- Nutrition education trainings tied with KAP provided to more than 800 farmers, leader farmers, farmer group's members and motivators. The training helped them improve their existing nutritional status.

A4. Bottom-up Planning, Co-ordination and Policy Issues

- Ten bottom-up planning workshops conducted (one in each pocket) involving 702 participants enabled the farmers identify their agricultural problems and make plan to solve it with the technical assistance from MARD.
- Several workshops and meetings related with LAs improved the co-ordination among LAs and diffuse the MARD technology.

A5. Monitoring and Evaluation

The crop production results indicated that yields in MARD project pockets were at least double than those in the remaining non-project areas. MARD areas also marketed higher proportions (by at least 10 percentage points) of both crop and livestock production. The results obtained from monitoring survey, 19997/98 are presented in Tables 20.

Table 20: MARD/Rapti Performance Indicators, 1997/98

Performance indicators (by USAID/Nepal strategic objective)		Pilot Survey 1995/96	Pilot Survey 1996/97	Monitoring Survey 1997/98 (a)	Adjusted Survey (b)
1.1 Annual HVC production (tons)		39876	43,789	18,537	72,802
1.2 Annual HVC sales (US$ million)		8.7	9.44	2.48	7.44
1.1.1 HVC farmers (c) (d)	Male			n/a	
	Female			n/a	
	Total			98% HH	
1.1.2 HVC traders (d) (e)	Male	4,094	4,592	2,030	
	Female		784	59	
	Total	4,094	5,376	2,089	
1.1.3 Off-farm enterprises (d)	Micro			3,815	
	% Female			4.6	
	Small			421	
	% Female			40.6	
	Med-large			87	
	% Female			0	
2.3 Improved nutrition status (d)					
% wasting, 6-60 months children			16.2	23.8	
% stunting, 6-60 months children			52.3	55.5	
Nightblindness					
Nursing mothers (%)		13.5	12.4	10.7	
Nursing mothers, prev. pregnancy				15.5	
Pregnant women (%)		11.7	13.5	16.4	
Pregnant women, prev. pregnancy				14.0	

(a) The monitoring survey covered the period July 1997-March 1998 for the three-district zone (Dang, Pyuthan and Salyan). No data are available for the April-June 1998 quarter, nor are there reasonable means for expanding or extrapolating the survey data to a full year period.

(b) Monitoring survey production and sales estimates are adjusted assuming that MARD crop area and livestock numbers are 40% of the respective control-MARD totals.

(c) HVC farmers were not directly identified in the survey. About 98% of the respondents (households) reported producing one or more of the HVC enumerated in the survey.

(d) Due to the small number of responses in certain categories, the estimates cannot be reliably disaggregated by MARD Project pockets versus control (non-project) areas, and therefore are estimates for the three-district zone (Dang, Pyuthan and Salyan).

(e) Small-large breakdown could not be reliably estimated.

Table 21: High-Value Production and Sales by Pilot and Monitoring Surveys in Rapti

Performance indicators	Pilot Survey, 1995/1996 (n=59)			Pilot Survey, 1996/1997 (n=59)			Monitoring Survey, Jul 1997/Mar 1998 (n=128)		
	Control	MARD	Total	Control	MARD	Total	Control	MARD	Total
CROP SUMMARY									
Estimated total area (Ha)	6213	14282	20496	6574	15531	22105	35634	4.072	39706
Estimated total production (Tons)	20680	24648	45328	24788	27231	52019	51265	18061	69326
Estimated yield (Tons/Ha)	3.33	1.73	2.21	3.77	1.75	2.35	1.44	4.44	1.75
Estimate total prod value.('000)Rs	188404	193405	381808	218591	232933	451524	479187	145543	624730
Estimated total prod value, $US million	4.01	4.11	8.12	3.97	4.24	8.21	7.37	2.24	9.61
Estimated total sales value, ('000) Rs	114738	114496	229233	125909	143021	268929	211801	82377	294178
Estimated total sales value, $US million	2.44	2.44	4.88	2.29	2.60	4.89	3.26	1.27	4.53
Sample sales, % of sample production	60.9	59.2	60.0	57.6	61.4	59.6	44.2	56.6	47.1
Sample average price (Rs /Kg)	9.1	7.8	8.4	8.8	8.6	8.7	9.3	8.1	9.0
LIVESTOCK SUMMARY									
Estimated total animals, hives, birds	360	308	668	364	316	680	871209	79204	950413
Estimated total production (Tons)	14496	15228	29724	15910	16558	32468	13194	476	13670
Estimated total prod value. ('000) Rs	312094	215678	527772	352599	286263	638862	475241	15632	490874
Estimated total prod value, $US million	6.64	4.59	11.23	6.41	5.20	11.62	7.31	0.24	7.55
Estimated total sales value, ('000) Rs.	82081	81526	163607	105427	115937	221364	156830	7269	164099
Estimated total sales value, $US million	1.75	1.73	3.48	1.92	2.11	4.02	2.41	0.11	2.52
Sample sales % of sample production	26.3	37.8	31.0	29.9	40.5	34.6	33.0	46.5	33.4
Sample average price (Rs/Kg)	21.5	14.2	17.8	22.2	17.3	19.7	36.0	32.9	35.9
TOTAL CROP-LIVESTOCK SUMMARY									
Estimated total production (Tons)	35176	39876	75051	40698	43789	84488	64460	18537	82997
Estimated total prod value. ('000) Rs	500497	409083	909580	571190	519196	1090386	954428	161175	1115604
Estimated total prod value, $US million	10.65	8.70	19.35	10.39	9.44	19.83	14.68	2.48	17.16
Estimated total sales value, ('000) Rs.	196818	196022	392840	231336	258957	490293	368630	89646	458277
Estimated total sales value, $US million	4.19	4.17	8.36	4.21	4.71	8.91	5.67	1.38	7.05
Sample sales % of sample production	39.3	47.9	43.2	40.5	49.9	45.0	38.6	55.6	41.1
Sample average price (Rs/Kg)	14.2	10.3	12.1	14.0	11.9	12.9	14.8	8.7	13.4

Note:

- Egg conversion rate is 20,000 eggs = 1 ton @ 1 egg = 50 gm. Cattle and buffalo sold live are included in total sale value of live animals, but not in total production value. Therefore, average price may be inflated. In livestock, where only number of animals were given, off-take rates were used to calculate production figures.
- Exchange rates are $US 1 = NRs 47. 55 and 65 for years 1995/96, 1996/97 and 1997/98 respectively.
- Farmer prices received are used, which are greater than standard "farm gate" price. Marketing margins are not available for estimating equivalent farm gate and wholesale prices.
- District level projections are based on district level population growth rates reported by National Research Associates. *Nepal District Profile, 1997,* and using household number as the basis for aggregation.

Table 22: Alternative Monitoring Survey Estimated of HVC Production in Rapti

	Monitoring Survey Estimates			Adjusted Estimates*		
	Control	MARD	Total	Control	MARD	Total
Crop Summary						
Estimated Total Area (Ha)	35634	4072	39706	23824	15882	36706
Estimated total production (Tons)	51265	18061	69326	34306	70518	104824
Estimated Yield (Tons/Ht)	1.44	4.44	1.75	1.44	4.44	2.64
Estimated total production value (000) Rs	479187	145543	624730	320665	793513	1114179
Estimated total prod value $US million	7.37	2.24	9.61	4.93	12.21	17.14
Estimated total sales value ('000) Rs	211801	82377	294178	137151	448958	586109
Estimated total sales value $US million	3.26	1.27	4.53	2.11	6.91	9.02
Sample sales, % of sample production	44.2	56.6	47.1	42.8	56.6	52.6
Sample Ave Price (Rs/Kg)	9.3	8.1	9.0	9.3	11.3	10.6
Livestock Summary						
Estimated total animals, hives, birds	871209	79204	950413	570248	380165	950413
Estimated total production (Tons)	13194	476	13670	8636	2284	10920
Estimated total production value ('000) Rs	475241	15632	490874	311068	75032	386100
Estimated total production value $US million	7.31	0.24	7.55	4.79	1.15	5.94
Estimated total sales value (000) Rs	156830	7269	164099	103969	34923	138892
Estimated total sales value $US million	2.41	0.11	2.52	1.60	0.54	2.14
Sample sales, % of sample production	33.0	46.5	33.4	33.4	46.5	36.0
Sample Ave Price (Rs/Kg)	36.0	32.9	35.9	36.0	32.9	35.4
Total Crop-Livestock Summary						
Estimated total production (Tons)	64460	18537	82996	42942	72802	115744
Estimated total production value ('000) Rs	954428	161175	1115604	631734	868546	1500279
Estimated total production value $US million	14.68	2.48	17.16	9.72	13.36	23.08
Estimated total sales value ('000) Rs	368630	89646	458277	241121	483880	725001
Estimated total sales value $US million	5.67	1.38	7.05	3.71	7.44	11.15
Sample sales, % of sample production	38.6	55.6	41.1	38.2	55.7	48.3
Sample Ave Price (Rs/Kg)	14.8	8.7	13.4	14.7	11.9	13.0

* Monitoring survey estimated were adjusted by assuming that MARD crop area and livestock numbers are 40 % of the respective contorl-MARD totals. Respective sample prices and marketing portions are left unchanged.

B. Lumbini-Gandaki

B.1. Market Development

i. Improvement in the competitiveness of the produces as shown by increase in demand and sales of hvc produced by the Project supported farmers groups.

- Formation of Marketing Group (MG) comprising farmers/members of couple of farmers Production Groups (PG) of certain cluster/site/VDC etc and conducting group marketing by the farmers representatives themselves to sell the surplus HVC produces of the farmers in the local and distant markets, has been a remarkable achievement of the Project leading to increase in demand and the sales of farmers produces.
- Out of 15 MGs, several MGs have been successful in conducting group marketing (group collection, transportation, group bargaining, use price information, group input purchase etc). MGs sold 1977 MT of HVC worth more than NRs. 21 million during FY 2000/01 alone. One MG of Palpa has been registered as a co-operative.
- Marketing groups/production groups are increasingly buying their inputs/seeds through group marketing leading to quality seed supply, cheaper price, reduced cost per unit in transportation.
- Another important aspect of MARD Marketing Approach has been construction of collection and sales stalls at different important markets by the

MGs themselves using their own resources (without any financial support from the Project). Sales stalls (made of simple low cost bamboo structure) at Butwal Haat Bazaar,Taulihawa Haat bazaar,Bazaar,Triyasi etc are important example of successful strategy of MARD leading to increased sales as well as achieving sustainability of the program.This low cost model can be easily replicated by other institutions without heavy investment and using local resources.

- MARD activities like market linkage tours/visits, active participation in the regular meetings of MGs and wholesalers/commission agents by the Project staff etc have greatly helped strengthen MGs and their capacity to understand/exploit market opportunities/establish linkages with the wholesalers of main markets.
- Marketing groups are found to be taking their produces to different markets on their own as they are well familiar with the market situation opportunities and practices. This has helped farmers increase their sales and income.

ii. **Market Information System (MIS) strengthened leading to market driven production planning.** Establishment of MIS useful to the commercial farmers has been one of the achievements of the Project. Installation of Price Information Boards(PIB) with price information (past price trend and current wholesale price of major markets)as well as technology package suitable to market windows at strategic places/markets has been helpful in improving production -market timing,selection of best market , bargaining power of the MGs etc.11 PIBs installed at different places, price information broadcast from Radio Nepal, Regional Station has helped increase market transparency/ increase the awareness of MGs/farmers about the importance of market information.

iii. **Post-harvest handling Practices Improved (through training/visits) leading to reduction in unit marketing costs/losses and increase in competitiveness.** Several training's/visits conducted by the Project has led to improved knowledge/skill of the farmers related to post-harvest handling losses (in handling, packaging, transportation, storage etc (of tomato, cauliflower, cabbage, etc.). More and more farmers are using improved packaging containers like plastic crates, improved containers, protective packaging materials, improved storage practices, extra care during transportation, proper grading and sorting etc.

iv. **Promotion of Agri-input sellers (agro-vets):** MARD promoted local agro-vets as an important means of improving supply of improved seeds/agri-inputs in the project area successfully. Number of agriculture input supply centers (Agro-vets) increased from 34 in to 72. Several training/visits were organized leading to establishment of new agro-vets as well as strengthening the existing local agrovets. Above 50 new and existing agro-vets have been strengthened during the project period.

v. **Sales of high value crops (HVC) is estimated to have increased by 4 times from NRs 110.7 million (US$ 1.7 million) in 1997/98 to NRs 462.2 million (US$ 6.06 million) in 2001/02**.

vi. **Sales of PCCT crops is estimated to have increased by >5 times from NRs 41 million (US$ 0.63 million) to NRs. 228.5 million (US$ 2.99 million)**

vii. Per cent sales of performance indicator crops (PCCT) is estimated to have increased from 67% to 80.2%.

viii. MARD Market Development Programs Replicated by Line Agency

- Line Agencies in the Project area are replicating many of the programs successfully implemented by the TA Team in the Project area. TA Team is providing technical support to LA on need basis to carry out marketing programs.
- Line agencies are installing MARD designed Price Information Boards (PIB) at different places.
- Similarly in line with the MARD TA approach several training, tours, material supports, etc are being provided by Line Agencies to the Marketing Groups formed by LA similar as TA. All these replications are indication of the continuity of the approaches,/strategies of market development activities initiated by MARD TA Team in Lumbini-Gandaki.

B2. Improved Extension and HV Agricultural Extension Services

i. Increased use of Hybrid technology: Successful introduction of hybrid cultivars especially in PCCT helped rapid diffusion and adoption of hybrid seeds for off-season production (early and late season) resulting in increased productivity.

ii. Expanded sites of MARD activities

- Expansion of intervention sites from 72 to 123 with an increase by 71% during the project period.
- In addition, many more other diffusion areas within and outside of MARD pockets were developed.

iii. Expanded farmers groups

- Farmer groups/production groups assisted changed from 82 to 161 (additional 2 in Syangja at diffusion site)
- Farmer groups increased by 97%

iv. Increased farmers' participation in HVCs

- Participation of farmers in farmer groups increased from 1584 in FY 1998/99 to 2767 in FY 2001/2002.
- Increase in farmer's participation was by 75%
- In addition, farmers not organized in groups also started practicing HVC farming in diffusion areas.

iv. Production groups organized into Marketing Groups

- Fifteen marketing groups were organized from production groups as compared to none at the beginning of the project.

- Eighty four production groups, out of existing 163, were involved in 15marketing groups serving 1483 households directly.

vi. Improved supply of seeds/Agro-inputs

- Agro-vet licensing training provided to 81 potential agro-vets in Lumbini-Gandaki At present, around 72 agro-vets are operating in MARD pockets of Lumbini-Gandaki ensuing improved supply of seeds/agro-inputs to the farmers.
- Increase in agro-vets from 34 to 72 with an increase by 112%.

vii. Expansion of HVC area

- PCCT harvested area is estimated to have increased by 57% from 1,122 ha to 1,764 ha.
- HVC harvested area is estimated to have increased by 33% from 6109 ha to 8132 ha.

viii. Increased productivity of HVC

- Productivity of PCCT is estimated to have increased from 6.1 mt/ha to around 19 mt/ha and of 43 HVCs is estimated to have increased from 3 t/ha to 9.8 t/ha during the project period.
- Productivity of PCCT increased dramatically by about three times.

ix. Crop diversified: Based on the market demand and market windows for better income opportunities, farmers are more inclined towards tomato, cauliflower, cabbage, cucumber farming besides many other HVCs.

x. Increased sale of PCCT as well as HVCs.

- Farmers in the MARD/Lumbini-Gandaki project area were able to increase their marketed produce from 67% of their production in 1998 to 80% of their production in 2002 because of increased market promotion and increased marketing activities.

xi. Increased income helped farmers to:

- Purchase additional land;
- Take land on lease for HVC farming;
- Construct buildings;
- Install small boring/water pump for irrigation;
- Provide better education to children;
- Improve nutritional status; and
- Improve overall life-style/standard of living etc.

xii. Farmer groups/marketing groups strengthened

- Intensive trainings and support to farmer groups and marketing groups operating in the project area might help enable these groups function on their own after the termination of project.
- Welfare fund generated by these groups over Rs. 3.2 millions so far will be cohesive factor to keep them together, thus making it sustainable.

xiii. Improved marketing skills/practices

- Skills on group marketing, post-harvest handling and marketing techniques improved.
- Madanpokhara marketing groups converted into cooperative.
- Marketing stalls at Butwal haat bazaar and Taulihawa haat bazaar established and operated by the marketing groups.

xiv. Improved nutrition status

- Increased practice or proper kitchen gardening 1576 KGs as compared to none of the beginning of the project.
- Nutrition practices reducing the incidence of night blindness in the project area improved from 48.6 to 86.2% with an improvement by over 77%.
- Incidence of night blindness in the project area reduced from 14.7 to 5.1% with a decrease by about 65%.

xv. Improved knowledge and technical know-how

- Technical knowledge and skills on HVC farming with more focus on hybrid technologies improved.
- Skills on group functioning improved.
- Skills on marketing practices/techniques improved.
- Nutritional knowledge and practices improved. Skill on participatory bottom-up/decentralized planning and group planning improved etc.

B3. Nutrition Improvement

- 48 nutrition demonstration households established and effectively used as a positive deviant model household to train and diffuse food based Vitamin A rich improvement program.
- 1576 kitchen gardens promoted (established).
- Level of nutrition knowledge is estimated to have increased from 23% in 1997/98 to 80.6 % in 2001/02.
- **Level of nutrition practices is estimated to have increased from 49% to 86.2%.**
- **Incidence of night blindness is estimated to have decreased from 14.7% to 5.1%.**

B4. Bottom-up Planning, Co-ordination and Policy Reform

- VDC level bottom-up planning workshops greatly benefited the farmers groups, marketing groups, Agro-vets, traders, LAs, TA staff by defining their roles in integrated and co-ordinated way.
- Helped established to a great extent demand led HVC production system.
- Identified farmers need based on-farm demonstrations and on-site trainings.
- Co-ordination between TA Team and LAs strengthened.
- Addressed policy issues.

B5. Monitoring and Evaluation

- Performance indicator targets established.
- Benchmark surveys in project pockets and non-pockets were conducted.
- Pocket area map developed and regularly updated.
- Conducted annual performance monitoring surveys in non-pockets area. However, performance monitoring survey in non-pockets stopped since 2000 due to security reason.
- High value commodities production and marketing from 1999-2002 for all MARD pockets are given in Table 23.
- Changes in performance over Benchmarks in the 6 pocket districts are given in Table 24.
- All the performance indicator targets have been fulfilled or exceeded (Table 23). Accomplishments made in performance indicators targets are summarized below:

Market development

- **Sales of PCCT crops is estimated to have increased by >5 times from NRs 41 million (US$ 0.63 million) in 1997/98 (benchmark) to NRs. 228.5 million (US$ 2.99 million) in 2001/02.**

- **Per cent sales of performance indicator crops (PCCT) is estimated to have increased from 67% to 80.2% (changed by 19.7%).**

- **PCCT harvested area is estimated to have increased by 57% from 1,122 ha to 1,764 ha.**

Technology and Improved Agricultural Extension

- **Productivity of PCCT is estimated to have increased from 6.1 mt/ha to around 19 mt/ha. Productivity of PCCT increased dramatically by about three times.**

- **Farmer groups/production groups assisted increased by 97% from 82 to 161 (additional 2 in Syangja at diffusion site).**

- **Number of agriculture input supply centers (Agro-vets) increased by 112% from 34 in to 72.**

Improved Nutrition

- **Nutrition practices reducing the incidence of night blindness in the project area improved from 48.6 to 86.2% with an improvement by over 77%.**
- **Incidence of night blindness in the project area reduced from 14.7 to 5.1% with a decrease by about 65%.**

Table 23: Summary of Project Performance Results for 2002

Indi-cator No.	S.O.	Indicator Description	Indicators Established on June 1999					New Indicators Approved on August 2000*							
			Base 1998	Target 1999	Actual 1999	Target 2000	Actual 2000	Indi-cator	S.O.	Base 1999	Target 2000	Target 2001	Actual 2001	Target 2002	**Actual 2002**
A-1	1.1	Annual sales of potato, cauliflower, cabbage, tomato in project pockets ($US million) [a]	0.63	0.64	1.35	0.77	1.67	I	1.1	1.35	1.51	1.69	2.11	1.84	**2.99**
		(Annual growth rate, %)		2	114	20	24			114	12	12	26	9	**42**
A-2	1.1.1	Farm household producing high-value ag. products in project pockets (000) [b]	33.9	34.6	34.8	35.3	35.5								
		(Annual growth rate, %)		2	2.5	2	2								
A-3	1.1.2	Farmers producing high-value ag. products in project pockets (000) [c]	33.2	33.9	34	34.5	88.3								
		(Annual growth rate, %)		2	2.5	2	160[c]								
A-4	NA	Farmers groups assisted in project pockets (number of groups) [d]	34	82	91	102	106	II	NA	91	102	128	148	151	**161**
		(Annual growth rate, %)			168	12	16.5				12	25	40	18	**9**
A-5	NA	Hectares of potato, cauliflower, cabbage, and tomato harvested in project pockets (hectare)	1,122	1,133	1,205	1,224	1,432	III	NA	1,205	1,253	1,303	1,563	1,340	**1,764**
		(Annual growth rate, %)		1	7	8	18.9				4	4	9	3	**13**
A-6	NA	Average yield of potato, cauliflower, cabbage, And tomato harvested in project areas (ton/ha)	6.1	6.2	14.0	6.9	16.04	IV	NA	14.0	15.1	16.3	17.5	17.3	**18.99**
		(Annual growth rate, %)		1	130	12	14.6				8.0	8	9	6	**8**
A-7	NA	Percent of potato, cauliflower, cabbage, and tomato production marketed (% sold)	67	68	68	71	71.5	V	NA	68	71	75	76.2	77.7	**80.2**
		(Annual growth rate, %)		1	1	5	5.2				5	5	7	4	**5**
A-8	NA	Number of Agro-vets operating in project Pockets (number) [e]	34	35	36	36	45	VI	NA	36	40	43	56	45	**72**
		(Annual growth rate, %)		2	6	5	25				10	8	24	6	**29**
A-9	NA	Nutrition practices reducing the incidence of night blindness in project pockets (%) [f]	48.6	51	71	53.6	71.8	VII	NA	59.8	62.8	65.9	81.6	68.3	**86.2**
		(Annual growth rate, %)		5	46	5	1.09				5	5	14	4	**6**
A-	NA	Incidence of night blindness in project pockets (%) [g]	14.7	14.6	8.8	14.4	9.6	VIII	NA	11.8	11.7	11.6	6.9	11.5	**5.1**
		(Annual growth rate, %)		-1	-40	-1	9.0				-1	-1	-28	1	**-27**

* Contract No. 367-C-00-97-00030-00, Modification No. 4,

Note : The performance indicators were established in MARD/Chemonics contract modification no. 1, dated June, 1999. On January 10, 2000 the new performance indicators were proposed to USAID and approved on August 2000 to be effective for the years 2001 and 2002. The total cultivated land area of some VDCs in 2000 and 2001 were found inconsistent with 1999 monitoring data. So, the 1999 total cultivated land data are used as a base in 2000 and 2001 monitoring report. Population and households results in 2001 are the 2000 result inflated by the HMG, Ministry of Population and Environment projected weighted annual different population growth rate for the project districts (Population Projections for Nepal 1996 - 2016, Vol 2, Sub-National Projections, June 1998) i.e. 2.54% (overall) but in 2002 result preliminary results of population census 2001 published by Central Bureau of Statistics, Ktm are used. **The growth rates for 2002 actual are based on 2001 actual results.**

[a] The 1998 benchmark and target are based on an exchange rate of Rs 65 = 1 $ US, and a 1998 base of Rs 40,968,000. The 1999 actual results are based on exchange rate of Rs 67.67 = 1 $ US, and a base of Rs 91,342,000. The 2000 result is based on an exchange rate of Rs 70.40, and a base of Rs. 117,830,000. Likewise, the 2001 result is based on an exchange rate of Rs 74.40, and a base of Rs 157,160,000 and 2002 result is based on an exchange rate of Rs. 76.3, and a base of Rs. 228,507,000.

[b] The 1998 benchmark was estimated as 90% (the 2000 actual result is 89.4%) of the 37,624 households reported in the project pockets, or 33,900 households, based on the assumption that 10% of the households are not farming, and all the farm households are producing at least one high-value agricultural commodity. The 1999 and 2000 results are the 1998 benchmark, inflated by the HMG estimated weighted annual population growth rate for the project districts, i.e. 2.52%. Note: The 1998 benchmark was based on total households/population reported by HMG line agencies/VDC secretaries.

[c] The 1998 benchmark was estimated as 98% of the benchmark household number. (In Rapti, 98% of farm households were estimated to be producing high-value commodities). The 1999 results are the 1998 result, inflated by 2.52%, as in the case of households above. The 2000 actual results are based on individual farmers (not household) producing high-value commodities.

[d] During 1999, the TA team created and assisted 47 new farmer organizations, & assisted 9 more previously unidentified organizations, in addition to the 34 organizations identified in the benchmark survey, for a total of 91 organizations assisted during 1999.

[e] The number of Agro-vets found in benchmark survey (Nov 1998) are reconciled in the case of Palpa and Kaski Districts.

[f] Scores based on 0-100 scale were estimated by randomly selecting 10 pregnant or lactating women in each MARD VDC. The nutrition practices score was estimated by calculating the percent of correct answers to 6 questions on food-based nutrition practices that reduce night blindness. The night blindness score was estimated as the percent of positive responses when asked if they are currently suffering night blindness, or suffered night blindness in their last pregnancy. Detailed explanations of nutrition performance indicators are found in: Parvati Shrestha and Larry C. Morgan, *The Impact of Improved Nutrition Knowledge and Practices on Night Blindness in MARD Project Areas*, MARD/Lumbini-Gandaki Technical Report No. 33, March 1999.

[g] 1999 baseline values are based on 1999 result except for indicators A-9 and A-10, where benchmark & 1999 actual value are averaged.

Table 24: High-Value Crop Production and Marketing in Project Pockets, 1999-2002

1999 Monitoring Survey of HV Crops in All MARD Pockets [a]

	Hectares	Tons	Yield (Tons/Ha)	Farm Price (Rs/Kg)	Production Value Rs '000	% of Production Marketed	Marketed Value Rs '000	Marketed Value Rank
Tomato	201	4485	22.35	10.64	47,725	85	40,357	1
Potato	671	7,748	11.55	7.85	60,825	51	31,187	2
Cucumber	79	2,114	27.28	12.18	26,104	79	20,589	3
Cauliflower	177	1,996	11.25	7.69	15,346	73	11,266	4
Ginger	177	1,525	8.6	12.27	18,703	54	10,015	5
Cabbage	156	2,667	17.15	4.26	11,375	75	8,532	6
Orange	59	670	11.45	13.29	8,908	74	6,619	7
Mango	156	1,721	11.00	7.53	12,952	42	5,456	8
Brinjal	93	1,120	12.10	5.64	6,310	77	4,858	9
Banana	92	770	8.41	10.09	7,772	62	4,811	10
…	…	…	…	…	…	…	…	…
Total HV Crops	6,336	35,832	5.66	9.03	323,578	57	184,087	
Total Non-HV Crops	31,755	68,989	2.17	9.46	652,413	22	145,995	
Total PCCT	1,205	16,908	14.03	8.00	135,271	68	91,342	
Million US $ @ 67.67					2.00		1.35	

2000 Monitoring Survey of HV Crops in All MARD Pockets [b]

	Hectares	Tons	Yield (Tons/Ha)	Farm Price (Rs/Kg)	Production Value Rs '000	% of Production Marketed	Marketed Value Rs '000	Marketed Value Rank
Tomato	260	5614	21.60	10.84	60841	89	54335	1
Potato	709	9356	13.20	5.97	55827	50	27656	2
Cauliflower	272	3950	14.50	7.98	31529	74	23245	3
Ginger	165	1121	6.81	14.62	16398	90	14838	4
Cabbage	192	4063	21.22	4.11	16698	75	12594	5
Radish	257	3462	13.47	4.96	17179	68	11619	6
Cucumber	80	1597	19.84	8.75	13964	67	9329	7
Banana	118	1176	9.98	11.74	13805	61	8413	8
Mango	184	1348	7.34	10.94	14749	52	7670	9
Bean (French)	83	885	10.70	9.61	8498	74	6301	10
…	…	…	…	…	…	…	…	…
Total HV Crops	6810	48,622	7.14	8.58	416,999	57	239,711	
Total Non-HV Crops	33,860	79,733	2.35	9.28	739,586	27	199,012	
Total PCCT	1,432	22,983	16.04	7.17	164,896	71.5	117,830	
Million US $ @ 70.40					2.34		1.67	

[a] MARD/Lumbini-Gandaki Performance Monitoring Data for the 2nd Project Year, 1998-99. MARD/Lumbini-Gandaki Technical Report No. 43, July 1999.

[b] MARD/Lumbini-Gandaki Performance Monitoring Data for the 3rd Project Year, 1999-2000. MARD/Lumbini-Gandaki Technical Report No. 74, July 2000.

Table 24 (cont'd). High-Value Crop Production and Marketing in Project Pockets, 1999-2002

2001 Monitoring Survey of HV Crops in All MARD Pockets [c]

	Hectares	Tons	Yield (Tons/Ha)	Farm Price (Rs/Kg)	Production Value Rs '000	% of Production Marketed	Marketed Value Rs '000	Marketed Value Rank
Tomato	325	7368	22.65	11.23	82,753	91	75,580	1
Potato	728	10,673	14.66	6.15	65,604	54	35,570	2
Cauliflower	306	4949	16.15	7.88	39,008	80	31,301	3
Cucumber	135	2885	21.32	9.37	27,035	69	18,721	4
Ginger	171	1419	8.30	15.92	22,597	74	16,685	5
Radish	286	4787	16.74	4.87	23,319	66	15,326	6
Cabbage	203	4364	21.50	4.34	18,955	78	14,709	7
Mango	181	1987	10.98	11	21,851	62	13,549	8
Banana	144	2528	17.56	9	22,023	61	13,388	9
Onion	134	2056	15.39	6.68	13,740	50	6,898	10
…	…	…	…	…	…	…	…	…
Total HV crops	7,272	62,204	8.55	8.78	545,913	61	331,564	
Total Non-HV Crops	33,877	79,253	2.34	7.83	620,499	30	188,613	
PCCT Total	1563	27,354	17.50	7.54	206,319	76.2	157,160	
Million US $ @ 74.40					2.77		2.11	

2002 Monitoring Survey of HV Crops in All MARD Pockets [d]

	Hectares	Tons	Yield (Tons/Ha)	Farm Price (Rs/Kg)	Production ValueRs '000	% of Production Marketed	Marketed Value Rs '000	Marketed Value Rank
Tomato	372	9017	24.26	10.96	98812	96	94713	1
Cauliflower	389	6461	16.63	9.83	63542	88	55947	2
Potato	770	12343	16.03	7.65	94378	56	52848	3
Radish	347	7250	20.91	4.38	31736	82	25928	4
Cabbage	234	5675	24.24	4.98	28274	88	24999	5
Cucumber	143	3385	23.61	8.63	29231	78	22827	6
Ginger	191	2413	12.60	12.24	29528	75	22026	7
Mustard Seed	2195	3010	1.37	20.49	61686	33	20278	8
Pear	161	3123	19.34	5.03	15709	87	13708	9
Onion	155	2823	18.20	6.68	18868	53	9931	10
…	…	…	…	…	…	…	…	…
Total HV Crops	8,132	79,597	9.79	8.96	713,228	65	462,182	
Total Non-HV Crops	33060	82223	2.49	7.74	636048	33	210176	
Total PCCT	1,764	33,495	18.99	8.51	285,006	80	228,507	
Million US $ @ Rs. 76.3					3.74		2.99	

[c] MARD/Lumbini-Gandaki Performance Monitoring Data for the 4th Project Year, 2000-2001. MARD/Lumbini-Gandaki Technical Report No. 95, July 2001.

[d] MARD/Lumbini-Gandaki Performance Monitoring Data, Preliminary Results for the 5th Project Year, 2001-2002. MARD/Lumbini-Gandaki Technical Report No. 111, February 2002.

Tale 25: Four Year Performance Monitoring Date (1999-2002) in MARD/Lumbini-Gandaki Pockets

Indicators	Kaski Pocket					Syangja Pocket					Palpa Pocket				
	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02
1. Population	35,943	36,954	37,992	38,978	40,007	21,575	22,367	21,909	22,315	22,487	31,891	32,200	32,512	33,137	33,551
2. Households	6,520	6,703	6,891	7,069	7,256	3,960	4,086	4,116	4,192	4,224	5,718	5,773	5,829	5,940	6,014
3. Household size	5.51	5.51	5.5	5.5	5.51	5.45	5.47	5	5	5.32	5.58	5.58	5.58	5.58	5.58
4. Farmers groups	33	66	106	108	130	59	31	92	133	136	19	92	73	46	63
5. Non-HV crop yield (ton/ha)	2.31	2.2	1.93	1.58	2.17	1.92	2.2	2.04	2.15	1.94	1.02	1.86	1.68	2.24	1.86
6. HV crop yield (ton/ha)	5.00	10.28	8.46	8.87	9.58	7.00	7.20	11.80	11.20	11.54	5.00	3.80	6.15	8.26	13.50
7. HV crop cultivated land area (ha)	887.0	1297.0	1363.0	1529.1	1696.3	251.0	302.9	527.7	548.1	598.4	941.0	978.0	924.5	968.8	1016.9
8. HVP marketed % of production	54	51	52	63	68	71	47	49	53	58	43	62	68	76	87
9. Value of HV products marketed, *not included livestock product value in 2001* (NRs '000)	130,982	163,389	153,423	96,580	130,695	17,915	58,813	85,059	40,912	44,077	42,971	51,563	73,056	55,042	88,512
10. Potato, Cabbage, Cauliflower, Tomato (PCCT):															
a. Cultivated land area (ha)	206.0	386.8	441.9	463.9	531.6	132.0	81.6	90.3	101.7	120.5	94.0	134.9	155.5	167.0	196.5
b. Crop yield (ton/ha)	13.00	18.80	17.10	18.21	18.42	9.00	15.70	19.41	19.91	20.42	6.00	9.98	12.01	12.75	18.54
c. Marketed % of production	68	69	73	77	80	82	87	85	90	91	40	44	60	65	86
11. % of women agri. product Sellers	13.1	11	22	27	23	0.8	26	10	14	16	-	23	43	31	32.4
12. % of women with Night-Blindness	10.0	8.5	0.8	3.1	1	16.7	3.9	4.7	3.1	3.0	4.3	-	9.5	2.1	-

Note: 1. The estimates are based on PRA of project areas in October 1998 (benchmark), June 1999, 2000, 2001 and January 2002 (performance monitoring). The livestock component was dropped in January 2000 as recommended by the mid term evaluation team. The 2000 livestock results are based on 1999 results inflated by the growth rate computed from livestock information published by Agriculture Statistics Division, National Research Associate, Nepal and other reliable sources.

2. Non-high value crops are wheat, rice, millet, barley and open-pollinated maize. 3. BM: Benchmark data

Table 25 (Cont'd…):

Indicators	Kapilvastu Pocket					Rupandehi Pocket					Nawalparasi Pocket					All Pockets				
	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5th Yr 2001/02	BM 1997/98	2nd Yr 1998/99	3rd Yr 1999/00	4th Yr 2000/01	5 th Yr 2001/02
1. Population	44,529	45,954	47,425	48,725	50,011	28,288	29,131	30,063	30,888	31,805	53,929	55,790	57,713	59,346	60,853	216,095	222,396	227,614	233,389	238715
2. Households	7,937	8,191	8,454	8,686	8,915	5,497	5,674	5,854	6,014	6,193	7,992	8,267	8,553	8,795	9,018	37,624	38,694	39,697	40,696	41620
3. Household size	5.61	5.61	5.61	5.61	5.61	5.14	5.13	5.14	5.14	5.14	6.75	6.75	6.7	6.7	6.75	5.74	5.75	5.7	5.7	5.74
4. Farmers groups	23	15	17	28	32	10	25	31	39	40	11	21	39	30	31	155	250	358	384	432
5. Non-HV crop yield (ton/ha)	2.11	2.4	2.73	2.68	2.71	3.53	2.16	2.58	1.94	2.94	2.14	1.94	2.72	2.68	2.55	2.3	2.17	2.35	2.34	2.49
6. HV crop yield (ton/ha)	2.00	5.96	11.13	12.79	13.50	6.00	7.94	8.45	10.45	11.68	1.00	2.34	3.51	5.19	5.65	3.00	5.66	7.14	8.55	9.79
7. HV crop cultivated land area (ha)	845.0	1092.0	927.7	1064.0	1156.9	677.0	662.6	828.4	853.4	1060.1	2508.0	2004.0	2239.0	2308.5	2603.8	6109.0	6336.0	6810.0	7271.9	8132.4
8. HVP marketed % of production	78	62	60	59	58	62	78	79	70	74	71	77	78	47	49	62	61	63	61	65
9. Value of HV products marketed, *not included livestock product value in 2001* (NRs '000)	18,936	43,117	66,901	51,421	63,697	22,147	73,714	84,935	41,906	61,685	59,720	150,081	195,455	45,704	73,516	292,672	540,677	658,828	331,564	462,182
10. Potato, Cabbage, Cauliflower, Tomato (PCCT):																				
a. Cultivated land area (ha)	419.0	263.5	260.9	317.3	347.2	222.0	215.1	288.4	303.0	329.4	49.0	122.7	195.5	209.8	239.2	1122.0	1204.7	1432.0	1562.7	1764.3
b. Crop yield (ton/ha)	1.00	10.55	17.33	19.71	19.89	8.00	12.40	15.57	16.88	19.57	6.00	12.68	14.30	16.12	17.76	6.00	14.03	16.04	17.50	18.99
c. Marketed % of production	54	68	71.18	74	76	67	69	72	81	82	36	46	57	59	70	67	68	71.5	76.2	80
11. % of women agri. product Sellers	10.9	17.0	14.0	14.0	14.9	7.8	23.0	-	9.0	12.8	3.3	45.0	3.0	9.0	9.4	9.3	22.0	12.0	14.0	15.7
12. % of women with Night-Blindness	25.3	23.44	13.8	12.9	9.8	26.4	16.1	19.4	15.9	13.5	8	-	8.8	3.9	3.0	14.7	8.75	9.6	6.9	5.1

Note: 1. The estimates are based on PRA of project areas in October 1998 (benchmark), June 1999, 2000, 2001 and January 2002 (performance monitoring). The livestock component was dropped in January 2000 as recommended by the mid term evaluation team. The 2000 livestock results are based on 1999 results inflated by the growth rate computed from livestock information published by Agriculture Statistics Division, National Research Associate, Nepal and other reliable sources.

Table 26: Comparison of Crop Production Estimates, Bench-mark Versus Non-Project Areas in MARD Project Pockets, MARD/Lumbini-Gandaki Zone, 1997-98/ 1998-1999

Non-project area in MARD/Lumbini-Gandaki Zone (6 districts), 1997-1998														
	Hectares		Tones		Yield (tons/ht)		Farm Price (rs/kg)		Production Value Rs '000		% of Production Marketed		Marketed Value Rs '000	
	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99
Non-HV Crops	410,242	235049	763,163	361113	1.86	1.54	8.47	8.46	6,467,684	3054379	32	20	2,071,761	618524
HV Crops:														
Potato	5,383	4539	22,691	44675	4.22	9.84	8.52	7.14	193,319	318837	14	40	27,241	127764
Cabbage	826	524	4,762	4455	5.77	8.50	6.88	6.06	32,757	26993	43	63	13,999	16903
Cauliflower	962	808	4,290	8007	4.46	9.91	10.90	13.52	46,765	108251	39	65	18,462	70872
Onion	1,287	997	6,561	10489	5.10	10.52	15.64	8.34	102,590	87516	25	22	26,018	19000
Tomato	602	185	3,636	1755	6.04	9.51	14.45	8.91	52,547	15640	40	26	21,246	3993
Total	9,060	7053	41,941	69381	4.55	9.84	10.20	8.03	427,978	557237	25	43	106,966	238532
All HV Crops	102,419	47722	201,363	167783	1.97	3.52	11.49	9.71	2,313,646	1628401	43	40	988,310	646541
(Note: Survey for estimating crop production in Non-project area for the year 1998-1999 conducted during August 1999)														
Project Area in Lumbini-Gandaki, MARD Pocket VDCs (24 VDCs)														
Non-project area in MARD/Lumbini-Gandaki Zone (6 districts), 1997-1998														
	Hectares		Tones		Yield (tons/ht)		Farm Price (rs/kg)		Production Value Rs '000		% of Production Marketed		Marketed Value Rs '000	
	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99	97/98	98/99
Non-HV Crops	36,366	31,755	83,674	68,989	2.30	2.17	8.91	9.46	650,423	652,413	22	22	145,938	145994.8
HV Crops														
Potato	700	671	3,022	7,748	4.32	11.55	7.54	7.85	79,711	60,825	29	51	22,995	31,187
Cabbage	102	156	1,070	2,667	10.49	17.15	7.14	4.26	11,400	11,375	75	75	8,537	8,532
Cauliflower	156	177	1,463	1,996	9.38	11.25	10.84	7.69	34,232	15,346	57	73	19,555	11,266
Onion	69	68	531	687	7.70	10.05	10.06	7.78	5,124	5,348	33	32	1,671	1,699
Tomato	164	201	1,326	4,497	8.09	20.44	11.03	10.65	48,357	47,888	79	79	38,321	37,878
Total	1,191	1,273	7,413	17,596	39.97	13.82	24.12	8.00	178,824	140,782	273	64	91,079	90,562
All HV Crops	6,108	6,336	17,653	35,832	6.07	5.66	9.40	9.03	405,368	323,578	53	57	213,645	184,087

Note: 1 Yields and proportion of production marketed are substantially lower in relatively isolated non-project areas for high-value crops as would be expected. Survey for estimating crop production for the year 1998-1999 will be conducted during August 1999 2. 1997/98 data is the bench-mark of the project pocket
3. All the estimates are based on PRA surveys

SECTION VI – LESSONS LEARNED

A. Leassons Learned

The MARD activities were designed to consider critical implementation issues in choosing the set of interventions to achieve annual performance targets. The important lessons learned during the project implementation are summarized below by project component for Rapti and Lumbini-Gandaki separately.

A1. Rapti

Key lessons learned during the project implementation from MARD/Rapti in the areas of Market Development, Technology and Improved Agricultural Extension Services, Bottom-up Planning and Policy Reform, and Monitoring and Evaluation are summarized below:

A.1.1 Market Development

- Establishment of cooperative and group-marketing programs requires far more intensive TA to not only create the programs, but to provide extended follow-up support than was envisioned in the design of MARD or realized in past Rapti projects;
- For marketing tours (in both Nepal and India) to be successful, the groups have to be small for logistical managment, homogeneous in experience and interests, and selected with specific linkages to project objectives;
- Plastic shipping crates are one of the most significant factors in reducing marketing costs of horticultural products (through reduced spoilage and wasted shipping space); and
- Timing of production and selection of appropriate varieties are some of the most important production decisions that determine market demand for high-value commodities.

A.1.2 Technology and Improved Agricultural Extension Services

- Extensive and scattered demonstration sites and pockets are difficult to manage for effective technology diffusion and adoption results with the limited manpower resources designed into the MARD project;
- Qualified and competent motivators are essential for field production and extension activities, farmers quickly identify incompetent motivators and complain accordingly;
- Hybrid technologies, with improved management practices, have easily outperformed open-pollinated technologies in both production and profit, but most farmers continue to prefer open-pollinated technologies simply because of cheaper input costs against their very limited cash budgets; and
- Field-level training programs, tours, and on-farm demonstrations are absolutely necessary steps in convincing farmers to adopt high-production technologies.

A.1.3 Improved Nutrition

- The diffusion and adoption of nutrition message (knowledge-attitude-practice) can be accelerated by using the positive deviant approach with leading households;
- Communities have to be mobilized to re-enforce nutrition messages; disseminated through demonstration households, group training programs, and health and agricultural workers;
- Emphasis on the health threats due to inadequate nutrition knowledge and inappropriate nutrition practices is an important and effective motivation for adopting nutrition messages; and
- Theoretical nutrition training, while necessary for the scientific integrity of nutrition programs, must always be overshadowed by practical nutrition demonstrations at the household and community level to reinforce the necessary attitudes and practices that lead to improved nutrition status.

A.1.4 Bottom-up Planning and Policy Reform

- Bottom-up planning workshop produce more fruitful results when the project beneficiary-participants have access to information on the development performance of their pockets relative to other (non-project) areas:
- Most of the policy problems facing Rapti are common to most other zones and mainly have solutions first at the national level;
- Bottom-up planning programs for rural development have equal or greater importance for their contributions to improved governance; and
- Much of the effectiveness of bottom-up planning and policy reform programs depend on the extent to which there are realistic divisions of public and private sector responsibility for sustainable development, particularly in the elimination of subsidies and income transfer programs disguised as development programs that benefit some individual but not the community or farmer groups.

A.1.5 Monitoring and Evaluation

- Past Rapti project and HMG high-value commodity production data have been reported as aggregations above the VDC level, such that an historical record to pocket trends in production, area, and yield is not available for benchmarking current MARD/Repti interventions, and therefore data need to be generated at VDC-level for future use;
- The lack of established performance benchmarks by USAID at the beginning of this project required the Team to expend far greater resources on monitoring than was planned in the project design;
- The additional costs of conventional stratified sample survey methods cannot be justified by the gains in estimation accuracy, relative to the overall performance requirements and available budget in this project; and
- The use of participatory rural appraisal data collection methods within project pockets is the limit to which project should engage in measuring its performance.

A.2 Lumbini-Gandaki

A.2.1 Market Development

- group marketing of high-value commodity can be more effective compared to individual marketing (for small farmers with small marketable surplus, in particular) for taking their produce to distant markets;
- successful promotion of group marketing required adequate technical and extension support;
- plastic packing crates greatly reduced post-harvest losses and marketing costs when transporting perishable high-value commodities to distant markets;
- installation and maintenance of price information boards at strategic local marketing points provided timely flow of market information and increased marketing transparency and bargaining power of farmers;
- specialized training (field level/project level) is needed to impart necessary marketing knowledge and skills to farmers group members to encourage them to group marketing;
- market visits by HVC producer farmers to regional and to main markets effectively exposed them to market opportunities/constraints and helped them in establishing business linkages;
- promotion of local agro-vets were found highly effective in supply of quality seeds and other production inputs;
- price information of regional markets are necessary for producer marketing groups to help them make decisions on where/who to market their produce.
- local market will be saturated and the price in local markets will fall with the increased supply of vegetables resulted by increased local production.
- farmers need to be organized in group to assemble and transport the surplus HVC vegetables through group marketing to distant big markets.
- regular contact/consultation to MGs; participation at MGs monthly meetings by field staff are essential for strengthening group marketing.
- post harvest handling training/post harvest loss assessment tours are very helpful in minimizing post harvest losses and improving farmers marketing practices;
- establishment of sales outlets by MGs at major markets/collection sites helped promoting group marketing, improving group marketing practices, and increased contacts with buyers/wholesalers of other major markets;
- broadcasting of price information news bulletin through Radio Nepal, Pokhara increased/improved market information transparency and increased coverage in project and non project districts;
- farmers located close to the big markets with good transportation facilities tend to prefer individual marketing to group marketing.

B.2.2 Technology and High Value-Agricultural Extension Services

- model On-Farm Demonstrations (OFD) were effective in spreading the adoption of new technologies;
- all farmer group members actively participate in such model if such demonstration packages are equally split amongst all interested members. More number of group members were found involved in OFD and diffusion trend was found in increasing rate.

- hybrid crop varieties have out-performed locally adopted technologies in both production and profit. This has led to increase member of farmers adopting hybrid crop varieties;
- training is necessary to create the entrepreneurial skills needed to use new technologies;
- skill-oriented practical training is more effective for learning; and
- group mobilization can be very effective in motivating farmers to commercial level of cash crop production and marketing.
- OFD seeds given to the group was found effective in the sense that there are yield records and acceptance from many farmers.
- When farmer groups purchase project planned OFD, it helped increased participation by the group members, and also as the purchase amount was deposited in the farmers group fund, the group had access to greater fund to carry out other activities such as IPM, etc.
- participating members also get seed during OST-training, hence vegetable area and production increased considerably.

B.2.3 Nutrition Status Improvement

- positive nutrition practices vary directly with the level of nutrition knowledge, and the incidence of night blindness varies inversely with those nutrition practices;
- local nutrition solutions can be found by identifying positive deviant households, reinforcing their behavior with improved nutrition knowledge and practices, and helping other nearby households to copy those practices;
- personal contact and individual counseling are very important for influencing changes in nutrition behavior and practice;
- participatory nutrition training is an exhilarating and effective means of understanding nutrition concepts and putting them into practice;
- key nutrition messages need to be translated into local dialects, especially for Rupandehi and Kapilbastu districts;
- participation in nutrition training programs should be extended beyond MARD farmer groups to accelerate adoption of practices that increase vitamin A consumption;
- promotion of action based field demonstrations led to positive behavioural changes in the target groups. The specific action based message on kitchen garden, production of green leafy vegetables/vitamin A rich vegetables and its consumption crucial for health led to significantly increasing the percentage of households with kitchen garden; and
- support from policy makers and local leaders in Nutrition communication can gear up the program.

B.2.4 Bottom-Up Planning, Co-ordination and Policy Issues

- broad community participation is necessary to make bottom-up planning an effective rural development tool;
- policy reforms are more effective when the relevant interest groups deliberate and decide issues in a transparent manner;
- government agencies are most effective in bottom-up planning exercises when they encourage dialogue and private sector solutions; and

- bottom-up planning and policy reform processes are more effective when all interest groups share a common understanding of the production and marketing characteristics of a local community.
- different development agencies try to form separate groups in the same community of the VDC rather than strengthening the existing groups thus creating confusion as the part of farmers; in may cases they become members of many different groups.
- field level extension workers have to be adequately trained to approach farmers and to help farmers organize themselves into functional groups.
- bottom-up planning when conducted at VDC-level helps to facilitate farmer groups into VDC-level resource sharing and program budgeting as well as in implementation, and later on into marketing group formation.

B.2.5 Monitoring and Evaluation

- less, but more precise information is far better than too much unnecessary information;
- make no apology for the simple treatment of data analysis issues;
- with adequate survey design and management, participatory data collection methods can be efficient and cost effective mean of measuring project performance;
- field M&E activities need to maintain close contact with local authorities (e.g., VDC/NP personnel) to ensure representativeness, transparency, and relevance of project performance measures to beneficiaries' interests; and
- mini-PRA methodology to gather community level data was found to be cost effective in collection of quality data from project areas. This also helped the community to assess their own performance status.

SECTION VII - CONCLUSIONS AND RECOMMENDATIONS

A. Market Development

i. Institutional development of farmers: Sustainable production and marketing of farmers HVC can be attained by farmers through establishment of farmers production and marketing institution. That farmers institutions "**marketing group**" formed frp, several HVC production groups of certain area. Such market group can collect truck load of produces and which can be transported to distant market. In the absence of truck load of produces the cost/unit of transportation will be high leading to loss in competitiveness of farmers produces in the competitive market. Majority of MGs in MARD TA are formed by joining the members of 6-8 production groups comprising of 60-100 households. Registration of the MG as cooperative has to be done only after MG members understand the importance of group well and demand help for registration.

ii. Strengthening/capacity building of farmers institution: Knowledge and skill of management and group marketing is necessary for the marketing group members to carry on their producer and marketing activities profitably and independently with their own resources.

iii. Develop more market out-lets and better linkage with larger markets: Experience of MGs show that local market cannot absorb local surplus production, which result because of adoption of improved technology leading to increased production. This leads to oversupply or glut in the local market causing fall in local market price. In order to avoid such situation and expand demand, there is absolute need of developing more market outlets and better linkages with larger markets. MARD TA experience has shown that the construction of low cost shed and use of plastic shed, use of weighing sales at the shed etc. can effectively serve as collection center for groups production and marketing.

Similarly, construction of such low cost stall at market center/hat bazaar can serve as collection center as well as sales stall for farmers production. The experiences of MG of Palpa and MG of Dayanagar VDC and Khudabagar VDC at Butwal Haat bazaar are good examples. MG of Kapilvastu Municipality has been able to maintain high price for their produces through group bargaining. This MG often played the role of price maker in the haat bazar, and often exported its (groups produces) to border markets in India on several occasion. The relationship/rapport /linkage between farmers and the vegetable wholesalers was greatly cemented by taking MG members to wholesalers at the markets and taking the wholesalers at farmers production pockets during the crop season. Dozens of market linkage tours/visits organized by the Project helped build this linkage, expose both MGs and vegetable traders market opportunities.

iv. Improve post-harvest handling practices: Improvement in handling practices was essential to reduce losses of such vegetables like tomatoes during transportation, as well as for reducing cost per unit of transportation. This helped farmers to maintain

high quality of their products leading to higher prices and increase in competitiveness of such product in the market.

Scores of training/tours/visits organized by the Project brought changes in the attitudes/awareness of the farmers leading to increasing use of plastic crates by many farmers, increase in taking extra care while picking, grading, sorting, using appropriate packaging materials, taking extra care in loading unloading etc.

v. Promotion of agro-vets/agri-input sellers: Establishment of new local agro-vets and strengthening of existing agro-vets greatly helped improve supply of different seeds and inputs in the Project area. Agro-vest were the primary source of information of HVC and other technologies to farmers with and outside of the project area.

vi. Develop Market Information System: Marketing begins from the very moment when a farmer decides what to plant.MARD MIS was installed mainly to benefit farmers decision making process. Installation of PIBs at different strategic points, Price Information Broad(PIB) broadcast of price information from regional radio station of Radio Nepal,Pokhara greatly helped improve market transparency in the Project area. The replication of PIBs at different points by DADOs is an encouraging thing.

Recommendations

One of the reasons of failures of several marketing programs/activities in the past have been the lack of holistic approach or in most case marketing activities were implemented as an isolated activity. Based upon the experience and lessons learned in Rapti and Lumbini-Gandaki zone a holistic package of marketing programs is recommended.

i. Strengthen MIS: Marketing information comprising price, price trend, marketing costs, market demand, supply data, etc need to be regularly collected, processed, evaluated, analyzed and disseminated to the concerned users regularly through radio, newspapers, PIBs. MARD type of PIBs need to be installed /updated at strategic points.

ii. Strengthen Group marketing/Cooperative Marketing: Formation and strengthening marketing groups at different production pockets through regular training,visits,attending and facilitating groups meetings etc need to be done. Providing material support like weighing machines, plastic sheets plastic crates to selected groups for demonstration at reasonable cost sharing basis necessary too.

iii. Develop more Market out-lets and linkages with Larger Markets: Organize mutual visits/ market tours for farmers and wholesalers at each others places (market , production pockets).

iv. Development of Collection Centers/sites: Encourage/facilitate MGs to organize collection points using MARD type simple low cost sheds at the production pockets. Encourage/facilitate MGs to construct MARD type sales stalls at the local major markets.

v. Improve Post -harvest handling Practices: Training /tours to be conducted to the farmers to increase awareness/skill/knowledge of farmers on post harvest handling of perishable commodities specially like tomatoes, cauliflower etc.

vi. Promotion of Agri-input sellers/Agro-vets: Training to be conducted for potential and existing agri-input sellers on technology/extension, management etc. to be helpful to the commercial farmers.

B. Technology and Improved Agricultural Extension Services

B1. Technology

i. There are many improved and hybrid varieties available in the seed market of Nepal sold by Agro-Vest. The improved seeds are produced within country and some imported from India and other countries. Most of the hybrid ones are from India, Japan, Korean and other countries Cauliflower Snowking and cabbage Greenstone are the hybrid ones being used by farmers for commercial production in most parts of Nepal. New hybrid lines of commercial crops have many good characters, which are given below:

- High yielding characters - Tomato Ramya, Manisha, Abhinash, Rekshita
- Increase size and weight - Tomato Ramya
- Uniform in germination - Most of the seeds
- Uniform size - Cabbage Greenstones
- Uniform in maturity - Most of the variety
- Wide adaptability - for off-season production
- Short duration varieties - Shagun in Okra
- Uniform marketable size - Tomato Ramya, Cucumber Mahyco
- Good quality for storage and transportation - Ramya and Manisha tomato
- Early or shot duration type - Shagun Okra
- Tolerance to high rainfall - Tomato CL,
- Tolerance to disease - Tomato Gresco, BL

ii. Off-season / Early / Late Production: MARD Project has prioritized off-season, early or late production in the project areas. Production of crops at times other than during normal season is known as off-season crop which actually changes availability in market. Farmers get high market price in compare to seasonal crop. Advantages of off-season, early or late vegetable production are given below:

- Higher price in the market and hence high net return per unit area
- tomato of Bharatpokhari of Kaski and Triyasi of Syangja has high market value when produced during July to October.
- early cauliflower of Dayanagar, Sundi and Gundi of Rupandehi and Patkhawa of Kapilvastu fetches high return when produced before November.
- early harvesting of cucumber i.e. March has high market price.
- radish 40 days early in Madanpokhara of Palpa is marketed at the rate of Rs. 10 to 12 per kg in Butwal market were as during main season price drops Rs. 2/kg.
- capsicum california wonder when produced during October/November has very high market price; it is true for chilli also.

- cabbage: greenstone produced during October/November fetches high price.
- No problem of marketing, because of limited availability in market.
- Possibility of exporting to long distant market.
- Availability of fresh vegetables during off-season makes long period of availability for consumers.
- Vegetable growing season can be extended.
- Helps crop diversification.

iii. Suitable off-season varieties of high value vegetables have been identified from the OFD studies and are being preferred for commercialization by the farmers themselves because of higher sale values (lean and peak season of some high value crops, and based on the performances, preferred varieties, their suitable planting/harvesting time and production potentials are given in Annexes-2.5 and 2.6).

B2. Improved Agricultural Extension (Recommendation)

i. Farmer groups/marketing groups should be handed over or linked with the concerned line agencies and NGOs to provide supports as needed to make them sustainable and ever lasting.

ii. Based on the good lessons learned from the participatory bottom-up planning exercises by the TA team, it should be institutionalized in other projects, line agencies and other development agencies/institutions.

iii. As agro-vets/agro-input suppliers have been seen very instrumental in helping farmers, the forthcoming projects and line agencies should give due considerations to promote such agro-vets to provide services to the farmers as needed.

B3. Improved Nutrition

i. It is important to monitor the changes in knowledge levels with the adoption rates for practices as there are situations where increased knowledge does not change practices. If this happens then additional research is needed through focus groups and using other qualitative communication research methods to determine why this is happening and to provide guidance for redesigning the communication program.

ii. Changing dietary practices is difficult no matter what country or culture. In Nepal there are some special challenges due to low education levels, low economic levels, lack of developed communication infrastructure, language and cultural barriers, and other factors. Therefore, reducing the incidence of night blindness through a food-based nutrition program and should be viewed in terms of mid to long term program requiring focused and adequate program budget planning.

iii. As the project is successful in spreading the nutrition messages in pocket VDCs this model can be adopted for diffusion in other pockets of the country as well.

iv. It is essential that a participatory approach be used which involves and mobilizes local influential groups - community groups, line agency field staff, private sector, mass media, and other - to be responsible for promoting Vitamin A and encouraging targeted end-user families to adopt recommended dietary practices. This is key to

creating behavioral change among end-users and for sustaining the program beyond the end of the MARD project.

v. The whole information package does not need to be presented to end-users at once. Since the general knowledge is low among end-users, the communication program should be in three phase. The assumption is that families need to understand and accept these messages before they will actively change their diets.

vi. The concept of self-help should be propagated. They should be mobilized to take care of their health by themselves rather than depending on development workers going to them and orientating what to eat and what not to eat. The community must realize that they themselves are responsible for their own health, health of their children and family.

vii. High priority must be given to hand over the food-based Vitamin A program to other agencies who are concerned with promoting improved nutrition.

viii. There must be coordination between nutrition and agricultural production intervention and also collaboration to increase production and consumption of vitamin A rich vegetables, food preservation and storage and food security.

B4. Bottom-up Planning, Co-ordination and Policy Issue

i. Coordination is most essential for effective implementation of the project. As observed in MARD project, where MARD Project Coordinator was frequently changed (four coordinators in about 5 years) and also most of them part timer holding two positions, thus not having enough time for coordinating MARD activities, it is suggested that full time coordinator for full project period should be deployed in forthcoming projects.

ii. As the budget for training/tour/study and capital equipments was not provided to the TA team which was observed as one of the constraints for improving coordination between TA and LA, it is suggested that such budget be incorporated in the TA team as is normally done in other projects for establishing better coordination between TA Team and Las in future projects.

iii. Bottom-up planning as a tool of development planning should be conducted regularly at the VDC-level in Nepal because VDC is the basic administrative, political and development unit in the country. This is something neither done by HMG's development ministry not by many donor agencies, thereby weakening the capacity building of VDC, as well as leading to inadequate transparency in the development activities in the districts.

B5. Monitoring and Evaluation

i. Almost all the planned intervention activities are implemented successfully and all the performance indicators targets have been fulfilled or exceeded, though the MARD/Chemonics project re-located in Gandaki-Lumbini and field activities even closed one month earlier on February 28, 2002. Only few activities were dropped in the fifth project year due to lack of budget.

ii. Household surveys, even if conducted under modified PRA conditions, are inappropriate observational units for estimating agricultural development impacts over large geographic areas (larger than a village). The cost of conducting the relatively large samples required to gain reasonable precision is prohibitive in projects such as MARD. A more practical approach is to use VDC's as the observational unit and conduct a PRA in each VDC in a manner that ensures reasonable representation from the main villages. The indicators solicited from the respondents should be clearly divided into either constants, such as "average" VDC yield, price or portion of production marketed, or sums, such as total area cultivated in a crop, and numbers of traders/agro-enterprises in the VDC.

iii. Data should not be collected in non-project areas (where no technical assistance is being provided) because (1) the additional cost further strains limited project M&E budgets; (2) some respondents may assume or demand that their area be given the same assistance as the project areas; and (3) collecting data on control areas can lead to its institutionalization as a means of using project resources to collect statistics that would not other wise be available, at the expense of funds that are diverted from project objectives. "Without project" indicators can be developed within the more remote parts of project areas that have been relatively less affected by project interventions to date. These proxies for control data can then be used to measure the incremental impact of project interventions on the pocket.

iv. MARD/Chemonics resources were extremely limited and not sufficient to train large numbers of personnel in improved M&E methods. MARD/Chemonics was also not given a mandate to perform this function in the original project agreement. However, it is recommended that the Ministry of Agriculture and Co-operative adopt the MARD/Chemonics PRA sample survey approach to collect raw performance data. In the HMG context, JTs/JTAs could perform the tasks of the MARD DCs, Motivators, and Village Data Recorders at the VDC-level, and then compete it to pocket and district levels.

v. Based on the technology diffusion assessment study results the TA activities implemented by MARD Lumbini-Gandaki Project are found to be highly effective in terms of providing greater opportunity to project beneficiaries for improving their farm enterprises. The study has indicated sufficient evidence toward the project's impact on the family income and health through program focus on promotion of high value crop production, marketing, nutrition and bottom-up planning, coordination and policy issues. The program strategy implemented by the project has been instrumental in mobilizing the farmer groups for effectively adopting new technology and group marketing in the given situation.

vi. The project operation though known to be short in duration seemed to have impressed not only the direct beneficiaries but also many other rural farming families because of its success in transferring HVC production and marketing skills to the target beneficiary groups resulting in higher economic benefit as well as improved status in the health condition of farm family members. It is observed that the consumption of high value commodities and nutritious food have increased in the farm households of the project pockets.

vii. The project has also created an opportunity for increased level of employment in the pocket area due to expansion in production as well as enhanced marketing activities

within the project localities. The project has largely attributed diffusion of technology of high value crop production and marketing among many of the farmers of project VDCs and beyond to participatory project activities implementation with no subsidy whatsoever. The lesson learnt through the project experience could successfully be replicable for other agricultural projects with due attention paid to recommendations and suggestions made under this study.

viii. In the project districts many school teachers, ex-service men, jobless and unemployed youths expressed their views that the MARD assisted high value commodity production and marketing program is their ultimate choice for assuring them better income opportunity than leaving the homestead.

ix. It was observed that the on-farm-demonstration results were being diffused to outlying farmers of the project VDC as well as farmers outside project VDCs. For diffusion of MARD technology and its wider adoption, the LA extension staff in close collaboration with MARD team members could conduct OFDs in other line agencies' demo-sites. The results of OFD, nutrition demonstration, improved production and marketing practices, bottom-up planning process and group mobilization should be widely circulated in the diffusion area as well as in other non-site VDCs of the project districts for achieving greater diffusion goal.

x. Trainings were participated only by group members. It is imperative the skill trainings for commercial production and marketing of high value commodities, nutrition and planning should be made available to representative farmers from diffusion area for extending diffusion and encouraging other farmers to adopt MARD technology.

xi. In the pocket area many farmers expressed their need to have collection center facility built for easy access to market disposal of farm surplus but the project support toward this aspect seemed to be inadequate. Such facilities proved to have accelerated technology diffusion and also considered as important rural business points for many of the customers, wholesalers and retailers to buy farm commodities. Since collection centers in the pocket area not only facilitate farmers for marketing their produce but also served as employment sources to many of the rural families. Due program focus is urgently needed in those pockets where production of high value crops has increased with an accelerated speed.

SECTION VIII – DISPOSITION OF THE PROJECT INVENTORY ITEMS

Project inventory items used by the project TA Team were handed over to HMGs Agriculture Offices in the project area in Rapti Zone and in Lumbini Gandaki Zone, to the Project Coordination Office, to the Department of Agriculture, Kathmandu and to the Ministry of Agriculture and Cooperatives, Kathmandu as per approval of Cognizant Technical Office (CTO) and understanding with Project Coordinator of the MARD Project. The distribution list with the names of offices in abbreviations receiving the inventory items are shown in detail in Annex-6.